

AS SEEN
IN THE
MAY 2008
ISSUE

Veterinary Practice News

THE INFORMATION LEADER
FOR VETERINARY PRACTICE
AND BUSINESS

What's Your Diagnosis?

By Anne Bahr, DVM
For Veterinary Practice News

SIGNALMENT: 4-month-old female small mixed breed dog

HISTORY: Fell off of bed onto her head and became dyspneic shortly thereafter; the patient was normal prior to this episode. Upon presentation, patient was distressed and had an elevated respiratory rate so that examination was limited. Radiographs including a right lateral and dorsoventral view of the thorax are available for interpretation.

Questions to Answer

1. What are the primary findings?
2. What do you think is the primary reason for the clinical signs?

Radiographic Findings

The cardiac silhouette is normal in size for a small breed dog of this age. A symmetrical alveolar pattern is noted in the caudal dorsal lung fields. On the lateral view, the air bron-

TO CLAIM one hour of continuing education credit with this article, go to www.PetRays.com.

chograms are not well seen due to the superimposition of both the left and right lung lobes.

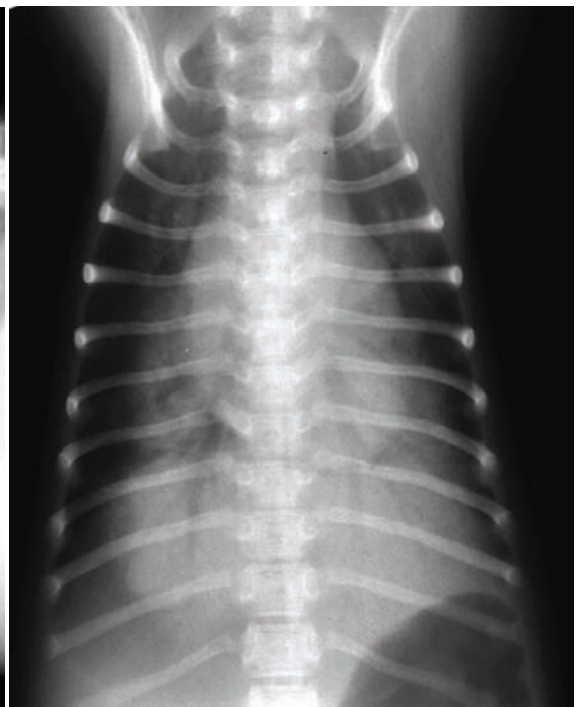
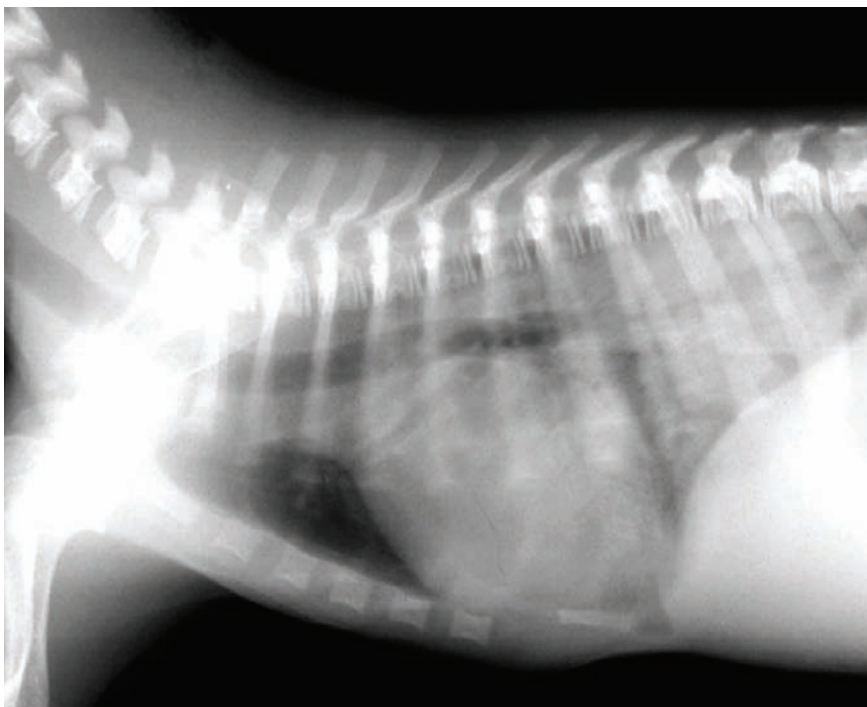
On the DV view, the air bronchograms are distinct. The pulmonary vessels in the caudal lung fields are not visible due to the alveolar infiltrate. The cranial lobar vessels seen on the lateral view to the cranial lung lobe are normal and symmetrical.

Interpretation

Symmetrical alveolar pattern in the caudal dorsal lung fields most consistent with noncardiogenic edema. Head trauma is the likely underlying cause of this pattern.

Discussion

There are three types of primary pulmonary patterns—alve-



AS SEEN
IN THE
MAY 2008
ISSUE

Veterinary Practice News

THE INFORMATION LEADER
FOR VETERINARY PRACTICE
AND BUSINESS

continued

olar, bronchial and interstitial. The hallmark radiographic sign of the alveolar pattern is the air bronchogram.

This is seen on a radiograph when an infiltrate (hemorrhage, inflammation/cellular infiltrate, edema or neoplasia) fills the smaller airspaces, creating soft-tissue opacity and the only visible air-filled structure is the adjacent primary airway.

Because of the infiltrate, the pulmonary vessels adjacent to the primary airway are not seen due to the silhouette sign between them and the soft tissue infiltrate.

Therefore, if vessels can be seen distinctly, an alveolar pattern is NOT present.

Bronchial patterns are commonly seen with inflammatory airway disease (commonly "feline asthma" in cats and bronchitis or eosinophilic bronchopneumopathy in dogs). The hallmark radiographic sign is a "donut" or "tramline." This occurs when the thickened airway is seen either end-on or from a side view.

Airways are commonly seen end-on in the region of the hilus due to the large number of branching airways in this area but they are not abnormal unless the airway wall is abnormally thickened.

Interstitial patterns are often considered the most difficult to identify and characterize. The hallmark radiographic sign is decreased visualization or indistinctness of the pulmonary vessels and the other structures that are normally seen on thoracic radiographs (cardiac silhouette, diaphragm, etc).

All the same etiologies that can cause an alveolar pattern can cause an interstitial pattern. Generally, unstructured interstitial patterns are just less severe examples of what is commonly seen as an alveolar pattern.

For example, if an animal has an interstitial pattern in the caudal lung fields, edema would be a primary rule out. If the edema continues to accumulate, it will eventually create an alveolar pattern.

Besides identifying the pulmonary pattern that is present,

the next step to radiographic evaluation is to determine the distribution of the pattern. By combining these two facts (type and distribution of the infiltrate) as well as utilizing any history or physical exam findings it will be possible to further define the most likely cause of the infiltrate.

In this case, the alveolar pattern is noted in the caudal lung fields in a young puppy which was previously normal.

Therefore, neoplasia and pneumonia are unlikely. The other two possibilities are edema or hemorrhage. Certainly edema would be a consideration with the two possible types being cardiogenic or noncardiogenic. Given that, the pulmonary vessels to the cranial lung are well seen and a cardiac cause of edema is not likely.

Hemorrhage (pulmonary contusions) may be possible as the patient has been recently traumatized but the infiltrate is very symmetrical, which would not be as likely in a traumatic event. Therefore, the most likely cause of the infiltrate is noncardiogenic pulmonary edema from head trauma.

Summary

When evaluating the lungs for infiltrate, identify the pulmonary pattern or patterns that are present. Determine the distribution of the pattern and then combine this information with any additional findings to create a differential list of possible causes.

In some instances, there will only be one likely cause (i.e. an alveolar infiltrate in the ventral aspect of the right middle lung lobe and a megaesophagus is most consistent with aspiration pneumonia; it is possible that another etiology could be at work, but is not likely).

In other instances, there may be several possibilities. In this situation, a diagnostic plan should be developed to methodically rule in or rule out the possibilities. ●

Dr. Bahr, Dipl. ACVR, is a consulting radiologist for PetRays Veterinary Radiology Consultants.

Besides identifying the pulmonary pattern that is present, the next step to radiographic evaluation is to determine the distribution of the pattern.