

Differentiating Significant VS Non-Significant Findings in Thoracic Radiology

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Reading and interpreting small animal thoracic radiography is a very challenging task as there are many organ structures that needed to be evaluated. Two main objectives of performing thoracic radiography are 1. to detect the abnormalities on the images and 2. to formulate a reasonable differential diagnoses. There are many normal variations for these organ structures depending on the age, breed and body conformation.

A well-positioned thoracic radiograph is a pre requisite for the success in detecting radiographic abnormalities. It is not easy evaluating an oblique radiograph, this is especially true for the cardiac silhouettes as they may appear enlarged on oblique radiographs. If the positioning of the thorax is less than ideal, a repeat radiograph to achieve good positioning is needed.

Cardiac Silhouette: The appearance of the cardiac silhouette is dependent on breed and body conformation. The most common error in reading thoracic images is overestimation of the size of the cardiac silhouette. This is especially true for the barrel-chested dogs when a heart murmur is detected during physical examination. The cardiac silhouettes of the deep-chested dogs are taller and those of barrel-chested dogs are slightly shorter and rounder. Sometimes the cardiac silhouette is larger due to the presence of pericardiac fat. In older cats, the cardiac silhouette will have a more horizontal position and a bulge may be present at the aortic arch.

Lungs: Many veterinarians remain confused about the interstitial and bronchial patterns of the lungs. The two main factors that can affect the appearance of the interstitial pattern are the age of the patient and the stage of respiration at the time of exposure of the thoracic images. In digital radiography, most dog lungs tend to have the appearance of an interstitial pattern when compared to conventional radiography. Older animals, especially dogs, tend to have a slight interstitial pattern of the lungs and typically do not cause any clinical signs. Bronchial mineralization is usually an age related bronchial change. It normally does not cause any clinical signs. Another possibility for the present of bronchial mineralization is due to prior bronchial disease. Another component of the

bronchial pattern commonly seen on thoracic images is bronchial wall thickening or peribronchial cuffing. This change is more significant than bronchial mineralization as it most likely represents an active bronchial disease.

Pleural cavity: The presence of pleural fissure lines is an important radiographic finding of pleural effusion. However this is often over interpreted in thoracic imaging. Fibrosis of the pleura and fat in the mediastinum can mimic the presence of a small amount of pleural effusion. Visualization of the lung margins does not necessarily represent pleural effusion. In many instances, this is seen due to partial inflation of the lung lobes. Over inflation lungs can sometimes mimic pneumothorax.

Mediastinum: Widening of the cranial mediastinum is one of the radiographic signs of cranial mediastinal lymphadenomegaly. In some cases of obese or brachycephalic dogs, the mediastinum could be very wide due to presence of abundant mediastinal fat. This is sometimes misinterpreted as a mediastinal mass.

Esophagus: Normally, only a small amount of gas is present in the mid thoracic esophagus. The caudal thoracic esophagus may be seen as a soft tissue, or fluid filled structure in left lateral recumbency. This is not commonly seen in right lateral recumbency. A gas-filled distended esophagus may be secondary to anesthesia or aerophagia. This finding should be clinically correlated.

Trachea: Collapsing trachea is one of the most difficult to diagnose conditions as this is a dynamic condition. Normally, fluoroscopy is the recommended imaging modality for the detection of collapsing trachea. Sometimes, the incidental finding of narrowing of the caudal cervical trachea may mimic collapsing trachea.

Spinal vertebrae: Narrowing of the thoracic intervertebral disc space is normally a non-significant finding unless it is accompanied by lysis of the endplates of two adjacent vertebrae indicating discospondylitis. Spondylosis deformans is a common incidental finding. Vertebral malformations such as transitional vertebra, blocked vertebrae and hemivertebra normally do not cause any neurological signs. Lysis of any vertebrae is considered important and is most likely due to neoplastic invasion.

Sternebrae: Pectus excavatum normally does not cause any clinical signs unless it severely compresses the heart leading to clinical complication. Degenerative changes and narrowing of the intersternebral spaces usually are not clinically significant. Malformation of the sternbrae may accompany other congenital anomalies such as peritoneopericardial diaphragmatic hernia.