# Ultrasound Diagnosis

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## History

An eight-month-old, spayed female, domestic shorthair cat was presented at the Chulalongkorn University's Small Animal, Veterinary Teaching Hospital with a five-day history of persistent regurgitation right after food or water intake. The cat was emaciated, dehydrated and had worsening respiratory distress. Hematological and serum biochemistry profiles were within normal limits with a blood morphology of anisocytosis. Survey radiographs of the thorax revealed an increase in soft tissue opacity in the cranioventral mediastinum. The thoracic trachea and cranial lung lobes were displaced dorsally and caudally, respectively. Esophagrams showed a barium-filled segment of the cervical esophagus, with no evidence of barium passing through the thoracic esophagus. These findings suggested the possibility of a cranial mediastinal lesion. A thoracic ultrasonography was performed to obtain more specific information.

## Ultrasonographic Findings

Transthoracic ultrasonographic examination was performed, using a real-time scanner with an 8-5 MHz broadband, convex, phased array transducer. The cat was scanned in dorsal recumbency using a parasternal approach. A moderately echogenic large mass, 3x10 cm in diameter, was detected in the cranial mediastinum, extending caudally into the mid mediastinum (Figure 1 and 2). This mass was primarily homogeneous and well-circumscribed. Cranial mediastinal vessels were deviated around the mass, but did not appear invaded. A small amount of anechoic fluid was noted to surround the mediastinal structures.

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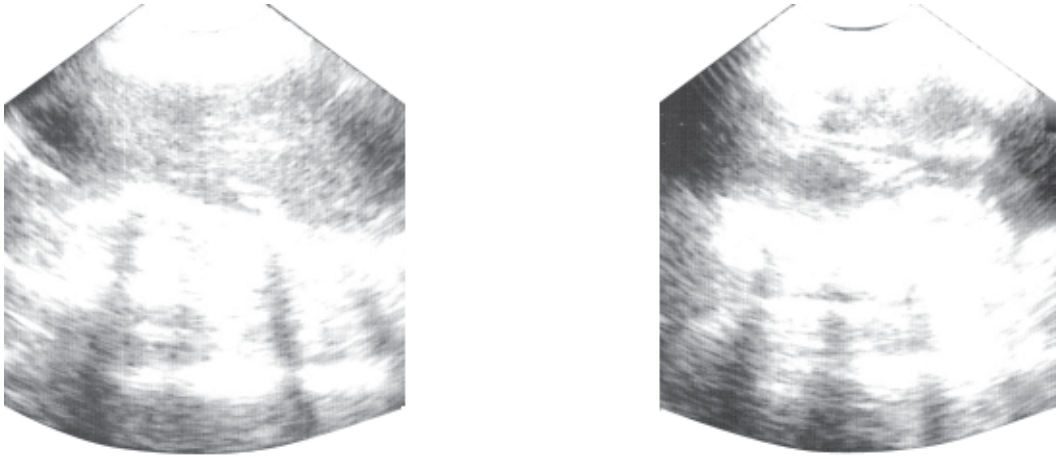

A B

**Figure 1** Sagittal parasternal ultrasonograms of the cranial mediastinum of an 8-month-old, spayed female, domestic shorthair cat in dorsal recumbency. The cranial (A) and caudal (B) aspects of the mass were well-defined, primarily homogeneous and moderately echogenic. The mass measured 3 x 10 cm. Cranial mediastinal vessels and a small amount of anechoic mediastinal fluid were noted.

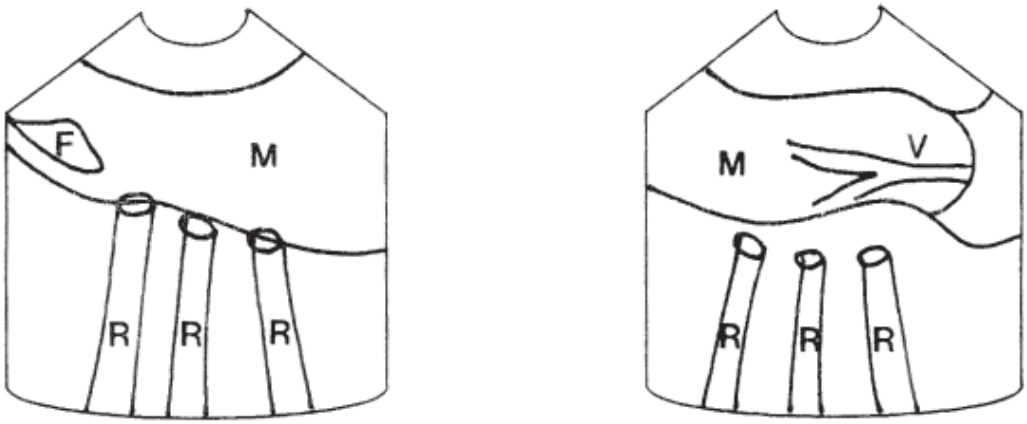


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**Figure 2** Schematics of the relative positions of the structures scanned in Figure 1. M-mediastinal mass; F- mediastinal fluid; V- mediastinal vessel; R- acoustic shadow distal to the rib.

## Diagnosis

Ultrasonographic diagnosis —— A cranial mediastinal lymphoma.

## Comments

Mediastinal lesions contiguous with thoracic wall, or accompanied by pleural or mediastinal fluid can be evaluated satisfactorily with ultrasound. Imaging is easy from a parasternal or intercostal approach. Animals with small mediastinal masses or with small amounts of pleural or mediastinal fluid should be imaged from their dependent side. Lesions on midline within the thorax, particularly multiple in number or lobular in appearance, are considered mediastinal in origin. Pleural or mediastinal fluid is ultrasonographically characterized as anechoic or hypoechoic material surrounding lung lobes or mediastinal structures. Sonographic determination of exact number of masses in the cranial mediastinum is

difficult (Konde and Spaulding, 1991). Masses larger than the physical limits of the ultrasound image, in a cranial-caudal dimension, are not accurately measured.

Mediastinal masses varied greatly in appearance. Ultrasonography, particularly when accompanied by guided tissue or fluid sampling, can be a valuable addition to radiography in the diagnosis of mediastinal lesions, especially in animals with pleural effusion and mediastinal masses. In this cat, severe pleural effusion was detected on thoracic radiographs ten days after the ultrasound examination. Cytological evaluation of the pleural effusion aspirate indicated lymphoma.

Lymphoma is the most frequently encountered mediastinal disease found in cats. It is commonly appeared as a well-circumscribed, uniformly hypoechoic, nodular mass (or masses) with a thin, distinct hyperechoic rim (Reichle and Wisner, 2000). Some advanced lymphomas may appear as complex or heterogeneous masses, identical to other types of mediastinal masses, such as mast cell tumor, thymoma, thyroid carcinoma, melanoma and a mass consisting of fibrous connective tissue and hemorrhage. Color flow Doppler analysis often shows extensive vascularity.

## References

Konde, L.J. and Spaulding, K. 1991. Sonographic evaluation of the cranial mediastinum in small animals. Vet. Radiol. 32(4): 178-184.

Reichle, J.K. and Wisner, E.R. 2000. Non-cardiac thoracic ultrasound in 75 feline and canine patients. Vet. Radiol. and Ultrasound. 41(2): 154-162.