Cardiomegaly

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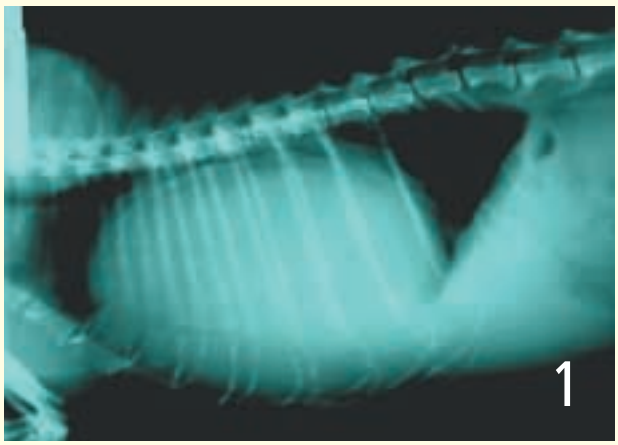
A 13-year-old, male, neutered domestic shorthair was presented for dyspnea.

History. The owner reported that the dyspnea had only been noted for 1 day, but the patient had a long-term history of intermittent coughing and wheezing. Testing had not been done to determine the cause. The patient was not treated with any medications. The medical history was otherwise unremarkable.

Physical Examination. The patient was dyspneic, cyanotic, breathing open-mouthed, and underweight (body condition score, 3/9). Femoral pulse quality was poor; jugular pulsations were visible. No murmurs, gallop sounds, or arrhythmias were detected on auscultation of the heart. Bronchovesicular sounds were increased in the dorsal lung fields.

Diagnostic Evaluation. Only one thoracic radiograph was taken (right lateral view; **Figure 1**) because of the patient's condition. The cardiac silhouette was markedly enlarged, with dorsal deviation of the trachea and restricted inflation of the lung lobes. Pulmonary vasculature and parenchyma were unremarkable. Rounding of caudal lung margins was noted, consistent with mild pleural effusion.



ASK YOURSELF…

Based on the clinical presentation and diagnostic findings for this patient thus far, what is the optimal diagnostic/therapeutic plan?

A. Oxygen therapy and parenteral furosemide administration
B. Oxygen therapy and administration of corticosteroids and bronchodilators
C. Echocardiography and pericardiocentesis
D. Thoracotomy for pericardiectomy
E. Sedation and thoracocentesis

continues

Correct Answer: C
Echocardiography and pericardiocentesis

The most likely cause of cardiac enlargement on the thoracic radiograph is pericardial effusion. In cats, pericardial effusion may be caused by neoplasia, infectious disease, coagulopathies, uremia, and CHF. Other differentials include peritoneopericardial diaphragmatic hernia, cardiac masses, and pericardial cysts.

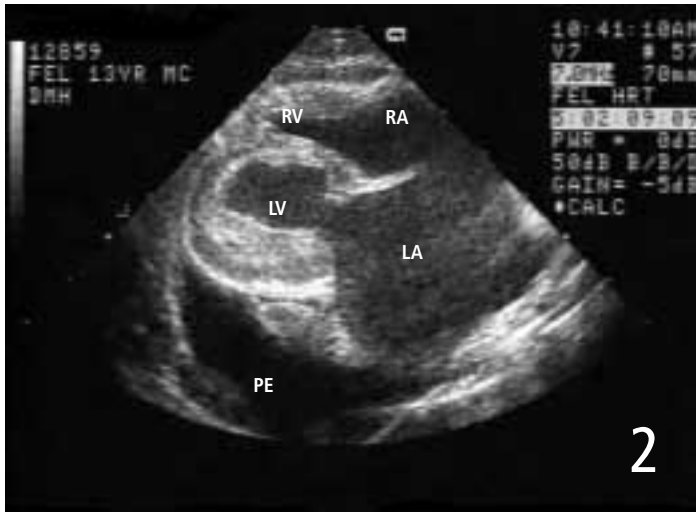
Echocardiographic, Fluid, & Other Findings

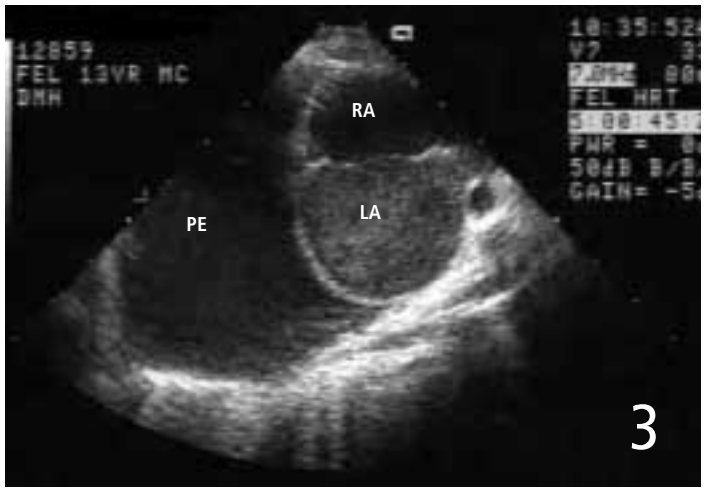
Echocardiography was done to determine the cause of the cardiac enlargement and to guide pericardiocentesis. **Figure 2** shows pericardial effusion, severe biatrial enlargement, right ventricular collapse (tamponade), and concentric hypertrophy of the left ventricular free wall. **Figure 3** also reveals severe pericardial effusion and spontaneous contrast within the left atrium. No cardiac masses were observed. Ultrasound-guided pericardiocentesis yielded 350 ml of serous fluid. Cytologic analysis of the fluid showed modified transudate with reactive mesothelial cells and no evidence of neoplasia. Laboratory evaluation included CBC, chemistry panel, serum thyroxine levels, and blood pressure evaluation. These studies revealed mild hyperglycemia, mild azotemia, and urine specific gravity greater than 1.050. All other results were within normal limits.

These findings support a diagnosis of HCM and CHF. Coughing is an unusual clinical sign in a cat with CHF, and in this case may have been caused by significant compression of the carina by the enlarged, turgid pericardium. Pericardial effusion of this magnitude is also an unusual manifestation of CHF in cats, but feline patients with myocardial disease can accumulate fluid in any anatomical location (pulmonary parenchyma, pleural space, pericardial space, and/or peritoneal space). According to reviews, lymphoma and FIP are the most common noncardiac causes of pericardial effusion in cats, but these disorders were not supported by the diagnostic findings in this case. Diseases causing secondary left ventricular hypertrophy were also ruled out. Detailed Doppler echocardiographic evaluation (not shown) further characterized the diastolic myocardial dysfunction.

Thromboembolic Disease

Feline patients with advanced HCM are at risk for CHF, systemic thromboembolism, and sudden arrhythmic death. Spontaneous contrast noted within the left atrium indicates sluggish blood flow and red blood cell aggregation. Patients with this finding and left atrial enlargement are considered to be at high risk for thromboembolic disease. Several therapies have been advocated for prevention of systemic thromboembolism in cats, including platelet inhibitors (aspirin, clopidogrel), vitamin K





TAKE-HOME MESSAGES

- Cats with significant cardiac disease may not have auscultatory cardiac abnormalities (murmur, gallop sound) on the physical examination.
- In cats with heart failure, fluid may accumulate in any body cavity, and therapy varies according to the site.
- Diuretics are contraindicated in the presence of pericardial effusion and cardiac tamponade in any species.

ACE = angiotensin-converting enzyme; CHF = congestive heart failure; FIP = feline infectious peritonitis; HCM = hypertrophic cardiomyopathy