New Standards in 2012 for Diagnosing Heart Failure in the Dog and Cat

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The definition of congestive heart failure is the failure of the left and/or right side of the heart to advance blood at a sufficient rate to meet the metabolic needs of the patient or to prevent blood from pooling within the pulmonary venous circulation. Chronic heart failure (CHF) traditional therapy (for CHF secondary to chronic degenerative valvular disease etc.) still provides a guarded prognosis. Though current standard treatment regimens provide a good quality of life for many canine patients, complications can lead to early patient loss. Ongoing congestion or syncope can be concerns, sudden death due to arrhythmias, or client-elected euthanasia due to poor quality of life may also lead to loss. The clinical signs of canine and feline heart failure are limited, but they must be distinguished from pulmonary dysfunction and also systemic problems. Heart disease often results in secondary respiratory signs (e.g., coughing or dyspnea); conversely, disease of the lung or its vasculature can result in secondary right heart disease (e.g., cor pulmonale). It is rare to find in any individual instance all the signs and other abnormalities that may characterize a specific disease. More commonly, an animal will manifest only some of these signs, usually in a way that the clinical elements of the disease emerge over time rather than being grouped at the outset.

Asymptomatic heart disease
At this level, a cardiac murmur or an ultrasound diagnosis of heart disease has occurred, but clinical signs are absent. Re-evaluation is the standard, and medication is not required.

Mild to moderate heart failure
Clinical signs of heart failure are evident at rest or with mild exercise and adversely affect the quality of life. Typical signs of heart failure include exercise intolerance, cough, an increased respiratory rate, dyspnea, and mild to moderate ascites. Home treatment is often indicated at this stage.

Advanced heart failure
Clinical signs of advanced congestive heart failure are immediately obvious. These clinical signs could include respiratory distress (dyspnea), marked ascites, profound exercise intolerance, or hypoperfusion at rest. In most cases, hospitalization is mandatory.

Biomarkers for chronic heart disease
Elevated cardiac troponin levels can indicate myocardial tissue injury. Most elevations in animals with cardiac disease are mild. Cardiac troponin can be elevated in both cardiac and extracardiac disorders. Serial measurements are probably better than just one measurement. The test should always be done in conjunction with ECG, echocardiography, radiographs, and other cardiac diagnostic tests. Extremely high concentrations of cardiac troponin are usually seen in animals with severe cardiac signs such as heart failure, myocarditis, and arrhythmias. .

Serum NT-proBPN concentrations in dogs with respiratory signs do help to differentiate between congestive heart failure and primary respiratory disease as the underlying cause. The presence of both cardiac and respiratory disease and pulmonary hypertension can cause some confusion in the use of these tests.

Cardiomyopathy
Cardiomyopathy is a disorder of the heart in which the abnormality lies within the muscle tissue (myocardium). A secondary cardiomyopathy is a disease that affects the myocardium secondary to infectious, toxic, metabolic, or other disease processes. The majorities of cardiomyopathies diagnosed today are of unknown etiology (primary or idiopathic) and are currently classified in the literature as representing the hypertrophic or intermediate forms.

Hypertrophic cardiomyopathy (Feline)
Classification

- Primary cardiomyopathies are classified according to their morphologic appearance:
  - Hypertrophic cardiomyopathy (HCM)
  - Idiopathic dilated cardiomyopathy (DCM)
  - Restrictive cardiomyopathy (RCM)
  - Unclassified cardiomyopathies
- Secondary causes of cardiomyopathy in cats include:
  - Nutritional (taurine deficiency)
  - Metabolic (hyperthyroidism, acromegaly)

- Infiltrative (neoplasia, amyloidosis)
- Inflammatory (toxins, immune reactions, infectious agents)
- Genetic (hypertrophic cardiomyopathy is suspected)
- Toxic (doxorubicin)

Hypertrophic cardiomyopathy (HCM) is the most common cardiac disease of the cat and is characterized by unexplained and significant left ventricular hypertrophy. The left ventricle is non-dilated and often hyperdynamic. Left ventricular hypertrophy can occur secondary to hyperthyroidism, systemic hypertension, or subaortic stenosis.

The mean age of affected cats is 6 years with an age range from 8 months to 16 years. Approximately 75% are male. Reported breed incidences are: domestic shorthair (DSH) (89 %), Persian (6.5%), domestic longhair (DLH) (2.2%), and Maine Coon (2.2%).

Clinical signs are variable. Cats are most often examined because a murmur, gallop rhythm, or other arrhythmia is detected during routine examination. Cases may be first diagnosed after severe clinical signs become apparent, such as pulmonary edema or systemic thromboembolism. Cats with congestive heart failure will exhibit tachypnea and labored breathing. A heart murmur is present in approximately 65 to 95% of all cats with hypertrophic cardiomyopathy. Other auscultatory findings may include a gallop rhythm (40%) and other arrhythmia (25%).

Diagnosis

Electrocardiography: Left atrial enlargement (p-mitrale – widened P-waves) and left ventricular enlargement (increased R-wave amplitude and/or increased QRS duration) are present. Arrhythmias are frequent. Most cats with hypertrophic cardiomyopathy will have a sinus tachycardia. Atrial and ventricular arrhythmias may be present. Interventricular conduction deficits, such as left anterior fascicular block, are occasionally present.

Radiography: Variable enlargement of the cardiac silhouette is seen. Left atrial enlargement is often most prominent. The cardiac silhouette may be normal. Cats with congestive heart failure may demonstrate enlargement of the pulmonary veins, variable pulmonary edema, and pleural effusion.

Echocardiography: Left ventricular hypertrophy involving the left ventricular free wall and, usually to a greater degree, the interventricular septum is present. The mean septal thickness of affected cats is reportedly 6.5 mm (normal 3.7 +/-0.7 mm).

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