EAST COAST VETERINARY CARDIOLOGY

# Hypertrophic Cardiomyopathy

Hypertrophic cardiomyopathy (HCM) is an acquired and typically idiopathic (meaning unknown cause) heart muscle disease commonly diagnosed in the cat. It is characterized by thickening of the left ventricle (LV) called concentric hypertrophy (hence the name). This hypertrophy of the LV results in an increase in heart muscle stiffness making the chamber non-compliant. This is called impaired relaxation and is a form of diastolic dysfunction of the heart muscle. This impairs the filling of the LV leading to dilation of the top storage chamber, called the left atrium. In most cases, the primary cause is unknown (idiopathic), but it may occur secondary to hyperthyroidism (an over active thyroid gland), hypertension, acromegaly and other less common causes. A familial and heritable form has been identified in Maine Coons and Ragdolls and a genetic test is presently available in these breeds through the veterinary cardiac genetics lab at North Carolina State Veterinary Teaching Hospital (https://cvm.ncsu.edu/genetics/). Studies to date have shown that approximately 30% of Maine Coon and Ragdoll cats carry the genetic mutation for HCM. Cats that only have one copy of the mutation (heterozygous) may never develop the disease whereas cats with both copies of the mutation (homozygous) will likely develop HCM.

The median age for diagnosis is typically 5.5 years and is equally distributed amongst males and females. Some affected breeds can develop the disease at a much younger age (Sphynx cats, Maine Coons). It is currently estimated that HCM represents about two-thirds of all feline cardiomyopathies. The disease can be challenging to diagnose as it is generally associated with a long occult (asymptomatic period) which may last for years. Affected cats may not have any physical examination abnormalities that suggest underlying heart disease such as a heart murmur, arrhythmia or an extra heart sound called a gallop. Therefore, unless an

echocardiogram is performed the disease could easily be missed in an affected individual. Echocardiography (heart ultrasound) is considered the gold standard for disease diagnosis. Biomarkers (blood tests) have been developed to try to detect cats with occult disease but they are not 100% sensitive or specific.

Affected cats are considered at risk for the following: arrhythmias related to heart muscle thickening and ischemia (decreased oxygen supplied to the muscle), congestive heart failure (CHF) and feline arterial thromboembolism (clots) secondary to left atrial enlargement. Unfortunately, arrhythmias in cats with HCM can be fatal. CHF is often associated with fluid either in the lungs (pulmonary edema) or around the lungs (pleural effusion) or both and is typically associated with labored breathing at rest as well as non-specific signs such as lethargy and a reduced appetite. Interestingly, unlike dogs with CHF cats in CHF typically do not cough. Coughing in cats is more likely to be associated with underlying feline allergic airway disease (feline asthma). Blood clots are a potentially devastating complication of HCM in the cat – these clots form within the heart chambers (specifically the left atrium) and can break away and move (embolize) to any part of the body. Typically, these clots will embolize to the arteries of the back legs leading to acute paralysis and pain. Recovery from a thromboembolic complication in a cat with HCM can be prolonged and often associated with a guarded prognosis.

Treatment goals in affected cats are to reduce fluid accumulation if present (heart failure) with diuretics and ACE inhibitors, prevent thromboembolic complications (using a platelet inhibitor called clopidogrel which has been shown to be superior to aspirin in cats with HCM), and treat any underlying disorder (hyperthyroidism, hypertension) if present. If cats have obstruction to outflow of blood from the LV (caused by systolic anterior motion of the mitral valve as a consequence of their LV hypertrophy), then beta blockers are may be prescribed.

Prognosis is variable with the median survival time reported to be 563 days for cats with heart failure. For those cats with feline arterial thromboembolism prognosis is more guarded with survival times reported at 77-184 days for those cats surviving the initial clot complication. For cats who are asymptomatic, some can live their entire natural lifespan free of clinical signs of heart disease.

## Key Points

HCM is the most common form of heart disease diagnosed in the cat.

Affected cats may not have any clinical signs or physical exam findings to suggest having the disease.

Affected cats are at risk for CHF, arrhythmias, sudden death and thromboembolic disease (clots).

A genetic test is available for Maine Coon and Ragdolls.

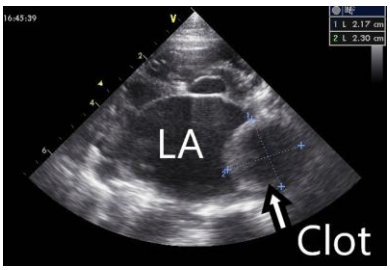
Echocardiography is considered the gold standard for disease diagnosis.

In some cats in can occur secondary to hyperthyroidism or systemic hypertension.

Signs of disease may include difficulty breathing, lethargy, poor appetite, fainting or acute paralysis of the hind limbs.

Cats with CHF don't typically cough.

Some cats can live their entire natural lifespan free of signs of disease.




A large thrombus (clot) measuring 2.17 x 2.30 cm located within the left atrium of a cat with HCM. The left atrium (LA) is severely dilated.