

Feline Heart Disease

FELINE HYPERTROPHIC CARDIOMYOPATHY (HCM)

Hypertrophic cardiomyopathy (HCM) is the most common form of heart disease in cats. HCM develops slowly over years and most cats go undiagnosed until they go into heart failure or throw a large blood clot into the aorta which causes acute pain and paralysis in the hind legs termed a saddle thrombus. (see saddle thrombus section for more details). HCM occurs when the heart muscle becomes abnormally thick which in turn decreases the size of the heart chambers- or the space in the heart where the blood collects before it is pumped out to the rest of the body. In HCM, the muscle contracts well, but can not relax normally due to the thickness of the muscle. Without this relaxation, there is little room for new blood to enter the chamber. As the hypertrophy or thickening of the wall progresses, the heart valves become non-aligned and a murmur often develops as blood flows backwards across the leaky valve with each heart beat. The regurgitation or backwards blood flow also causes large blood clots to form in the heart in many cats. These clots are deadly when a piece breaks off and travels down the aorta eventually causing a plug (see the saddle thrombus article for more information). Decreased chamber size, a non-compliant wall and blood regurgitation across the valves all contribute to a decreased volume of blood being pumped through the heart to the rest of the body. Initially, the body compensates for the decreased cardiac output of blood by increasing the heart rate and retaining sodium to increase blood volume. As the myopathy (heart muscle disease) progresses, the chamber size and wall compliance worsens to the point where the cat goes into congestive heart failure.

Symptoms

- Exercise intolerance
- Sudden onset of labored breathing
- Open mouth panting
- Weight gain or loss
- Acute onset of paralysis of both hind legs (with saddle thrombus)

Diagnosis

- **Physical exam-** the veterinarian will carefully listen to the heart with a stethoscope to **listen for heart murmurs, muffled heart sounds, and irregular beats and rhythms**. The pulses are felt at the same time to identify pulse deficits- when a heart beat is heard but there is no associated pulse. **Pulse strength** and quality is assessed as well.
- **In congestive heart failure**, the cat will have labored breathing, a high heart rate, and weak pulses. If the cat has left sided heart failure, fluid crackles can be heard in the lung fields indicating pulmonary edema. With right sided heart failure, fluid builds up in the space around the lungs which makes it difficult for the lungs to expand with each breath. The build up of fluid is termed pleural effusion. Most cats present in congestive heart failure and have both pleural effusion and

- pulmonary edema indicating biventricular or left and right sided heart failure.
- **Radiographs-** are used to evaluate the heart shape and size. In HCM, the heart is usually a normal size except for an enlarged atria which shows up as a classic valentine shape. Since most cats present in heart failure, fluid densities can be seen in and around the lung fields.
 - **ECG or electrocardiogram** traces out the heart's electrical activity and is used to assess rate, rhythm, and heart enlargement based on the shape and size of different parts of the electrical complex. A flat line ECG (often seen in the movies) indicates no electrical activity in the heart which equals death.
 - **Echocardiogram (cardiac ultrasound)** is the most accurate diagnostic tool for evaluating the heart. Ultrasounds are used to look at the function of the heart and to measure the size of the heart chambers, thickness of the walls, valves, and major vessels. Additionally, blood volume and direction of flow can be evaluated- which allows the cardiologist to measure cardiac output (blood volume pumped through the heart) and evaluate the severity of murmurs.
 - **In HCM**, small chambers and thickened heart walls are seen along with enlarged atria which sometimes have a large blood clot in it. There is often a murmur across the valves that can be measured with doppler. With an echocardiogram, the cardiologist can accurately assess the degree of heart disease, give a more accurate prognosis, and most importantly choose the appropriate medication (s) for each animal.

Treatment of Hypertrophic Cardiomyopathy

Cats with HCM are commonly treated with diltiazem, a drug that blocks calcium channels and improves relaxation, and Lasix, a diuretic to help decrease the buildup on fluid in and around the lungs, and eliminate extra sodium in the urine. Low doses of aspirin are recommended as well to help prevent blood clots from forming in the heart. Many other drugs can be used, most on a temporary basis, to improve cardiac function. It is highly recommended to consult a veterinary cardiologist for long term management.

Prognosis

Entirely dependent upon each individual but generally guarded to poor prognosis for long term survival. With proper therapy, some cats do well for years. Other cats do not respond to medication and die quickly in heart failure.

FELINE DILATED CARDIOMYOPATHY

Dilated cardiomyopathy (DCM) was once the most common form of heart disease in cats due to a dietary deficiency of taurine- an important nutrient required for normal heart function. Fortunately, DCM is fairly rare today due to well balanced quality cat foods available that contain daily requirements of taurine. Without taurine, the heart muscle cells enlarge leading to a decreased ability to contract normally. This in turn leads to a decreased volume of blood being pumped through the heart to the rest of the body. The

body compensates for the decreased cardiac output of blood by increasing the heart rate and retaining sodium to increase blood volume. As the myopathy (heart muscle disease) progresses, the heart itself enlarges and the heart valves start to leak. When this occurs, a heart murmur is heard with each heart contraction. DCM is a progressive disease which worsens over time eventually throwing the cat into congestive heart failure. If a cat is suspected of having DCM, it should be put on supplemental taurine. Any cat on a home made diet should receive a taurine supplement daily.

Symptoms

- Exercise intolerance
- Sudden onset of labored breathing
- Open mouth panting
- Weight gain or loss
- Acute onset of paralysis of both hind legs (with saddle thrombus)

Diagnosis of Dilated Cardiomyopathy

- **Physical exam**- same parameters as with hypertrophic cardiomyopathy.
- **Radiographs**- in cats with Dilated cardiomyopathy, the heart is often very large on the x-ray. Since most cats present in heart failure, fluid densities can be seen in and around the lung fields.
- **ECG or electrocardiogram**-same parameters as with hypertrophic cardiomyopathy
- **Echocardiogram**- shows a big floppy dilated heart that has minimal ability to contract. Doppler probe measures the severity of the murmur.

Treatment

There is a wide variety of heart medications available (most of which are used to treat disease in humans), and treatment is based on the individual animal. All cats with DCM should be immediately started taurine supplementation. Lasix or furosemide is a diuretic used to help decrease the buildup of fluid in and around the lungs, and eliminate extra sodium in the urine. Many other drugs can be used, most on a temporary basis, to improve cardiac function. It is highly recommended to consult a veterinary cardiologist.

Prognosis

Entirely dependent upon each individual but generally guarded to poor prognosis for long term survival. With proper therapy, some cats do well for years. Other cats do not respond to medication and die quickly in heart failure.