



ACVIM Fact Sheet: Dilated Cardiomyopathy

Overview

Dilated Cardiomyopathy (DCM) is one of the most common acquired heart diseases in dogs. This disease is rarely diagnosed in cats or small-breed dogs; however, it is a common cause of heart disease in large and giant breed dogs, and usually occurs more in those that are middle- to older-aged. DCM is a condition where the heart muscle (myocardium) loses its ability to contract normally and as effectively (figure 1). Although DCM can affect both sides of the heart simultaneously or separately, myocardial failure of the left side is most common. Since the heart muscle cannot work as efficiently to pump blood out of the heart, blood backs up within the heart chambers and the heart enlarges in size.

If pressures on the left side of the heart become significantly high as a result of increased blood volume, left-sided congestive heart failure or pulmonary edema (fluid within the lungs) can result. Although less common, myocardial failure of the right side of the heart can also occur. Similar volume overload of the right heart may result in right-sided congestive heart failure, often resulting in excessive free-fluid in the abdomen (ascites) and/or chest (pleural effusion).

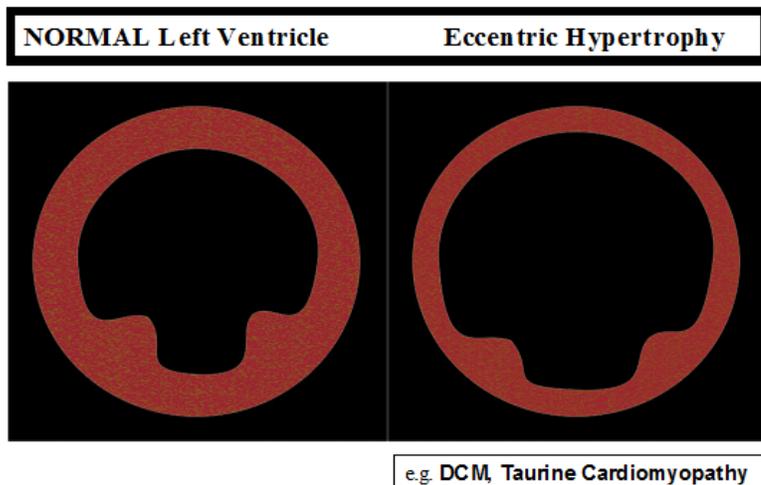


Figure 1. Normal left ventricle (a chamber of the heart) on the left (red color represents the heart muscle), while on the right the heart muscle is dilated and enlarged and the amount of blood volume (black color inside the red) is increased as the heart muscle due dilated cardiomyopathy (DCM) cannot eject the blood out into the circulation normally.

Although there have been many theories as to the cause of DCM, the exact mechanism is still not fully understood. A familial or genetic component is believed to exist in the majority of cases. This is because of the prevalence of the disease in specific breeds such as the Doberman Pinscher, Great Dane and Boxer. However, specific genetic evidence

for majority of cases is still lacking. Dilated cardiomyopathy is rarely reversible, and individuals that have it usually have it for life. A rare exception is taurine deficiency, which is a lack of whole-body stores of the amino acid taurine. Taurine deficiency can be the cause of the problem when dilated cardiomyopathy is detected in a dog whose breed is not typical for dilated cardiomyopathy as a purely genetic problem. If taurine deficiency is suspected, your veterinarian can send a sample of your pet's blood to a laboratory to check the taurine level, which will either confirm or rule out taurine deficiency. However, please be aware that not all cases that are supplemented with taurine will improve.

Signs & Symptoms

The signs of DCM vary depending on the breed of dog and stage of the disease. Loss of appetite, pale gums, increased heart rate, coughing, difficulty breathing, periods of weakness, and fainting are signs commonly seen. Since blood (plasma) is being backed up into the lungs, respiratory signs are usually due to pulmonary edema and/or heart enlargement. Blood returning to the right side of the heart from the body may also back up leading to fluid accumulation in the abdomen (ascites) or in the chest cavity (pleural effusion). Weakness or collapse may be caused by abnormal heart rhythms (arrhythmias) and poor distribution of blood (depressed cardiac output).

Diagnosis

A thorough physical examination by your veterinarian, coupled with your pet's clinical signs and specific breed, may help make the presumptive diagnosis of DCM. Other tests that help support the diagnosis are an ECG (electrocardiogram) and x-rays (radiographs) of the chest. The ECG may show an arrhythmia and/or an elevated heart rate. The chest radiographs may show an enlarged heart and/or fluid in the lung tissue or chest cavity. Please be aware that there are certain subsets of dogs that may show no abnormalities on their chest radiographs, but have arrhythmias on their ECG. These pets may be in the early stages of DCM. Your veterinarian may need to monitor your pet's heart rhythm over a 24-hour period of time to detect any arrhythmias that may be taking place throughout the course of a day. This is done by using a Holter monitor whereby your pet can go about their daily routine and simultaneously have their ECG recorded. An ultrasound of the heart (echocardiogram) confirms the diagnosis of DCM. By having an echocardiogram performed on your pet, the ultrasonographer can visualize the interior of the heart and assess its function. Measurements of the muscle wall thickness and pumping ability of the heart can be made as well. These procedures may be best performed by a board-certified veterinary cardiologist, and your veterinarian may discuss the possibility of a referral to one of these specialists (directory: www.acvim.org in North America, www.ecvim-ca.org in Europe).

Treatment & Aftercare

Treatment is tailored based on clinical presentation of each individual patient. In summary, patients with right-sided heart failure will have fluid physically removed from the abdomen and/or chest cavity. Drugs commonly used are diuretics (e.g. furosemide to remove fluid that has accumulated in the abdomen or lungs and can cause your dog to drink more water and urinate more), angiotensin-converting enzyme inhibitors (ACE

inhibitors to relax blood vessels to allow more efficient blood flow from the heart and to ease the workload on the heart) and positive inotropic agents (e.g. pimobendan to increase the strength of contractility of the heart muscle tissue). Other potential treatments after careful consideration of side-effects and that are recommended under the supervision of a cardiologist include medications such as carvedilol and metoprolol or injections of myoblasts (viable cells) into the myocardium (heart muscle). Supplements such as L-carnitine, taurine, omega-3 fatty acids and others could also be part of the treatment protocol. It should be noted; treatment of DCM is tailored to the patient's exact situation and therefore is almost never the same from one case to another.

Prognosis

Unfortunately, DCM is rarely reversible and individuals that have it usually have it for life. A rare exception is taurine deficiency in a small subset of the population as discussed above. Medical therapy can help, but long-term survival is variable for each animal. Once in congestive heart failure, the prognosis worsens. Initial response to therapy may also play a role in determining long-term prognosis. In addition, Dobermans may have a worse prognosis than other large breed dogs. Once the diagnosis of DCM is made, ask your cardiologist to discuss your pet's prognosis on an individual basis.

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