Subaortic Stenosis

ABOUT THE DIAGNOSIS

CAUSE: In dogs, as in humans, the heart is an organ made of muscle cells. When the heart contracts, it pumps oxygenated blood to the body and at the same time it sends "used" unoxygenated blood to the lungs to pick up oxygen. Within the heart are four chambers and four valves to accomplish this task. The four one-way valves ensure that blood always flows in the correct direction.

Subaortic stenosis is a narrowing (stenosis) of the area underneath one of these valves, the aortic valve, that causes some degree of obstruction or blockage of the blood flow through the heart. The narrowing can be mild, moderate, or severe; if moderate or severe, it can force the heart to work harder and potentially be harmful to the heart's health.

Subaortic stenosis is a problem that affects dogs but not cats. It most commonly occurs in large-breed dogs. Subaortic stenosis appears to be genetic in origin; the first signs of it may be present in the first few weeks of life (moderate or severe cases) or may appear later in the first year of life (usually milder cases). The most common clue that subaortic stenosis exists is a heart murmur heard by a veterinarian with a stethoscope; there are many other possible causes of heart murmurs, however, such that tests are necessary to pinpoint the cause of the murmur (see below). In moderate and severe cases, symptoms such as weakness, breathing difficulty (dyspnea), fainting (syncope), and, in extreme cases, sudden death are possible as a result of subaortic stenosis.

DIAGNOSIS: Your veterinarian will perform a thorough physical examination (including listening carefully with a stethoscope for a heart murmur or irregular heartbeat) and take a complete history, including asking you about whether you have seen any of the symptoms described above, whether your dog's siblings or parents have been diagnosed with a heart murmur or with subaortic stenosis, whether your dog is receiving medication, and so on.

Chest x-rays are useful if symptoms such as labored breathing are present because dogs can develop labored breathing for many reasons, not just subaortic stenosis. Chest x-rays can show the telltale signs, such as fluid accumulation in the lung tissue in severe cases, and help to rule out other problems with similar symptoms.

An electrocardiogram (ECG) depicts the pattern of electrical activity in the heart and is the best way to identify any irregularities in the heart's rhythm (arrhythmias).

An echocardiogram, commonly called cardiac ultrasound, is the test of choice for subaortic stenosis. To perform this exam, a small area of the dog's chest may be shaved and an ultrasound probe is gently moved along on the skin. An image of the inside of the heart is displayed on a monitor in real time. This test allows the veterinarian to assess the valves (including any narrowing), blood flow patterns and velocity, degree of stenosis (i.e., extent of blockage), and other aspects of cardiac structure and function. Probably the most important functions of the echocardiogram are to confirm or deny that subaortic stenosis is present and, if it is there, to assess its degree of severity. The degree of severity is assessed using several components of the ultrasound exam, especially Doppler ultrasound, which measures the direction and flow of blood as it courses through the heart.

LIVING WITH THE DIAGNOSIS

Mild subaortic stenosis is of no consequence to an individual dog, and generally the only intervention is to recommend not breeding, in order to avoid perpetuating the problem through genetic amplification in later generations. Moderate or severe subaortic stenosis may cause symptoms and may increase the risk of life-threatening collapse. Depending on the exact degree of severity, treatment may be required, and other measures (such as limiting activity) may be recommended to minimize the amount of work done by the heart.

There is no cure for subaortic stenosis. Since it is thought to be of genetic origin in some breeds such as golden retrievers, boxers, rottweilers, and some others, it is often recommended that dogs with subaortic stenosis not be bred to avoid passing the disease along to future generations. The pattern of transmission is variable and unpredictable, likely because some dogs are carriers of the genetic defect causing subaortic stenosis even though their own hearts appear normal. This likely explains why having a dog's parents be clear of subaortic stenosis does not guarantee that the offspring will be clear. Routine screening of all dogs prior to breeding is essential for reducing the spread of subaortic stenosis.

If treatment is necessary, give medication to your dog exactly as directed. Medication may control some symptoms and improve quality of life. As the disease progresses, medication may need to be increased or changed. Understand the possible side effects of all medication being given so that you know what is normal and abnormal.

Subaortic stenosis disrupts blood flow in such a way that infection of the heart valves (endocarditis) is more likely to occur than in dogs who do not have subaortic stenosis. Therefore, to decrease the possibility of causing or worsening endocarditis, antibiotics usually are prescribed before any surgical procedures, including prophylactic teeth cleanings, and whenever the risk of blood-borne infection exists (e.g., any wounds).

Follow your veterinarian's instructions to limit activity and stressful situations. These can make symptoms worse or even be life-threatening in dogs, especially those with very severe subaortic stenosis.

TREATMENT

If the degree of subaortic stenosis is mild, treatment is not required. However, subaortic stenosis can get worse as a growing dog reaches its adult age and body size. Therefore, dogs with moderate or severe subaortic stenosis, whether they have that degree of subaortic stenosis when first detected or whether they "grow into" a more severe form of subaortic stenosis, may require medication. The most common form of treatment is a type of medication given orally (pills) called beta-blockers, which reduce the intensity of the heart's work, help to prevent the heart from beating too fast and can control arrhythmias.

Several surgical procedures and minimally invasive (balloon catheterization) procedures have been performed to reduce the obstruction of subaortic stenosis. Some have shown promise, notably cutting balloon valvuloplasty, and you should consider

discussing this option with a veterinary cardiologist if your dog has severe subaortic stenosis. See web links, below.

DOs

- If your dog has difficulty breathing or collapses, go to your veterinarian or the local veterinary emergency clinic immediately, even if the collapse is brief and your dog is back on his or her feet shortly.
- Inform your veterinarian if your dog has ever been diagnosed with a medical condition and is taking medication.
- Give medication exactly as directed by your veterinarian, and if you are concerned about possible negative effects, discuss them with your veterinarian immediately rather than simply discontinuing the treatment.
- Understand that subaortic stenosis is a spectrum that ranges from mild (most common—requires no treatment, does not affect quality of life, and does not shorten life span) to severe (potentially life-threatening).
- Realize that dogs with subaortic stenosis, even severe subaortic stenosis, may look perfectly healthy and active. These dogs generally do not realize that their hearts are compromised in any way—the heart is sick, but the mind is not. If your dog has been found to have moderate or severe subaortic stenosis, it is important to reduce the workload on the heart (and therefore to decrease the risk of sudden, serious symptoms like collapse, fainting, or even sudden death) by controlling or avoiding bursts of sudden activity or any intense exertion.
- Discuss with your veterinarian what an acceptable balance is between activity restriction (to minimize cardiac risk) and activity for enjoyment (quality of life).
- Consider consulting with a veterinary cardiologist (directories: www.acvim.org, www.ecvim-ca.org) for an expert opinion and latest treatment options.

DON'Ts

- Do not postpone visiting your veterinarian if you observe any symptoms of subaortic stenosis. Prompt diagnosis and treatment can improve your dog's quality of life.
- Do not breed a dog that has subaortic stenosis.
- Do not give medication that you have at home that has been prescribed for human use; some of these may interfere with treatment and cause even more severe problems.

WHEN TO CALL YOUR VETERINARIAN

- If you cannot keep a scheduled appointment.
- If you are unable to give medication as directed.

SIGNS TO WATCH FOR

- Symptoms of subaortic stenosis include weakness, exercise intolerance, difficulty breathing, and fainting.

ROUTINE FOLLOW-UP

- Subaortic stenosis, if severe, can be a serious disease that may significantly shorten your dog's life. Follow-up appointments are important to monitor progress, to determine if treatment should be adjusted, and to keep your pet as comfortable as possible.

Practice Stamp or Name & Address