



Always consult with a veterinarian that you feel comfortable with before diagnosing or treating any disease on your own. This information is for reference only.

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Pulmonic Stenosis

Issue Description

As part of normal circulation in the body, the right side of the heart (the right ventricle) pumps blood to the lungs to receive oxygen. The oxygenated blood goes back to the left side of the heart from which it is pumped out to the rest of the body.

Blood flows from the right ventricle of the heart through the pulmonic valve into the pulmonary artery and thence to the lungs. With pulmonic stenosis, there is partial obstruction of normal blood flow, most commonly due to a malformation of the pulmonic valve ("pulmonic valve dysplasia") but the abnormality may be immediately above or below the valve as well.

The effect of this partial obstruction is to force the heart to work harder to pump blood to the lungs. The extent to which a dog will be affected depends on the degree of narrowing (stenosis) of the valve area. With severe stenosis the dog will likely develop congestive heart failure due to the increased workload of the heart.

Causes

Pulmonic stenosis appears to be a polygenic threshold trait.

Symptoms

In its milder forms, the slight thickening of the pulmonary valve will cause minimal or no obstruction and your dog will not be affected. However with more severe thickening of the valve, the obstruction of blood flow from the right side of the heart will cause varying degrees of heart damage which worsens with age. With moderate-to-severe pulmonic stenosis, your dog may experience signs associated with low cardiac output and/or right-sided heart failure, such as respiratory difficulties, fainting, tiring with exercise, abnormal cardiac rhythms, abdominal swelling due to an enlarged liver or the accumulation of fluid because of failing circulation, or sudden death.

Based on your dog's physical examination and diagnostic tests such as chest x-rays and an electrocardiogram, your veterinarian will discuss with you the severity of the pulmonic stenosis. If there are significant changes evident, he or she will suggest further tests to determine the pressure gradient across the pulmonic valve. (Normally there is no pressure difference between the right ventricle of the heart, and the pulmonary artery to the lungs.) Where there is a pronounced pressure gradient, surgery to correct the stenosis should be considered.

Diagnosis

The first indication that your dog has a problem may be when your veterinarian hears a heart murmur on an early physical examination. Alternately, you may see signs in your dog related to heart disease, such as fainting or fatigue with exercise. Your veterinarian will listen carefully to try to determine the location of the murmur and to differentiate it from an "innocent" murmur which disappears by about 6 months of age. If the murmur is significant, your veterinarian will suggest further tests such as a chest x-ray, electrocardiogram, and cardiac ultrasound to help determine the cause, and to see what changes if any have already occurred in the heart as a result of the defect. Once pulmonic stenosis has been diagnosed, Doppler echocardiography or cardiac catheterization can be done to measure the pressure gradient between the right ventricle and the pulmonary artery, to determine the severity of the obstruction. Based on these test results your veterinarian will discuss with you the long term prognosis for your dog and whether surgical correction of the defect should be considered.

Treatment

With mild-to-moderate stenosis, your veterinarian will monitor your dog. No other treatment is necessary unless

clinical signs develop which are associated with heart disease. Surgery is an option in dogs with moderate-to-severe pulmonic stenosis, with different techniques recommended depending on the site of the stenosis. Because of the expertise and technical equipment required and the surgical risk involved, surgery to correct pulmonic stenosis is generally performed in a referral center.

Surgery is more risky if atrial fibrillation or congestive heart failure have developed. These conditions should be treated medically and the dog stabilized before surgery is considered.

Medical management for congestive heart failure is similar no matter what the cause, and consists of medications to support the heart muscle and decrease the work load of the heart, together with dietary recommendations.

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