



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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Patent Ductus Arteriosus

Issue Description

At birth, mammals must adapt from living in a fluid environment (the amniotic fluid) and acquiring oxygen through the mother's blood, to breathing air and acquiring oxygen through their own lungs. The ductus arteriosus is very important in the adaptation process. This is a small communicating blood vessel between the pulmonary artery (which carries blood to the lungs), and the aorta (which carries blood to the rest of the body). Before birth, most of the blood from the fetal heart bypasses the fetal lungs via the ductus arteriosus. The lungs gradually become functional fairly late in fetal development. At birth, the blood supply from the mother is of course cut off, the dog (or other mammal) begins breathing on its own, and blood flow through the ductus arteriosus decreases dramatically. Within a few days, the ductus closes off completely.

Where the ductus does not close, the dog is left with a patent ductus arteriosus.

The extent to which this affects the dog depends on the degree of patency, or opening, of the ductus.

Other Names

PDA

Symptoms

The degree to which your dog is affected depends on the magnitude of the defect. This can range anywhere from a small blind pocket off the aorta which doesn't cause any problems, to varying degrees of abnormal blood flow through the ductus between the aorta and the pulmonary artery. Most commonly there is a shunt from the left to the right side of the heart, with blood from the higher pressure aorta continuously shunted to the main pulmonary artery. This means an increased volume of blood to the lungs which results in fluid build-up (pulmonary edema) and volume overload to the left heart. You may see coughing, reduced tolerance of exercise, loss of weight, and eventually, congestive heart failure. Without surgery, premature death is likely.

Less commonly, there is a right-to-left shunt. This may be the case from birth or, it may develop because the PDA is so large that the pressure in the lungs, and resultant resistance to this pressure, markedly increase. In effect, the circulation is the same as when the dog was a fetus - that is, some of the blood leaving the right side of the heart bypasses the lungs entirely. This results in circulation of poorly oxygenated blood. Your dog may have shortness of breath and weakness or collapse in the hind limbs.

Diagnosis

Usually a PDA is first suspected when the veterinarian hears the characteristic continuous "machinery" heart murmur when your dog is examined at the time of vaccination.

There are radiographic and electrocardiographic signs to confirm the diagnosis. At this point your puppy will not likely show any clinical signs relating to the PDA.

Treatment

Surgery is recommended in all dogs less than 2 years of age in which a left-to-right shunting PDA has been diagnosed. Surgical treatment consists of tying off the patent ductus and is quite successful. Surgery should be performed as soon as possible - as early as 8 to 16 weeks of age - before changes have occurred as the heart tries to compensate for the defect. The prognosis for a normal life with early surgery is usually very good. Where there are signs of heart disease, there are increased risks associated with surgery and your veterinarian will recommend medical stabilization before surgery.

The problems associated with the less common right-to-left shunt are managed medically rather than surgically. Treatment includes rest, exercise restriction, and avoidance of stress. Your veterinarian will monitor and work with you to manage the changes which occur due to the circulation of poorly oxygenated blood.

Breeds Most Affected

PDA is the most commonly diagnosed congenital heart defect in dogs. It occurs in many breeds and is seen more often in females.

The breeds at most risk for this disorder are the Maltese, Pomeranian, Shetland Sheepdog, and Kerry Blue Terrier.

Other breeds with an increased risk are the Keeshond, Miniature and Toy Poodle, Bichon Frise, Yorkshire Terrier, English Springer Spaniel, Collie, Cocker Spaniel, German Shepherd, Irish Setter and Chihuahua.

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