



Veterinary Specialists of Alaska, P.C. Client Information Sheet: Patent Ductus Arteriosus (PDA)

Patent Ductus Arteriosus (PDA)

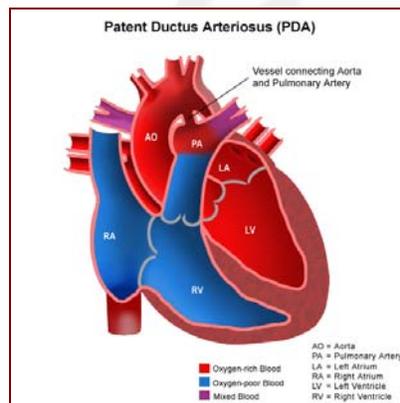
Dirsko J.F. von Pfeil, Dr.med.vet., DVM, DACVS, DECVS; Mike Edwards, DVM, MS, DACVS

Patent Ductus Arteriosus (PDA) describes a congenital abnormality of blood vessel anatomy of the heart. It is the most common congenital heart defect in dogs.

For a better understanding of the disease we would like to explain first, how the blood flows through the heart in a healthy animal. Please also see the diagram shown below. In a normal animal, blood flows from the right side of the heart through the pulmonary artery to the lungs where it is enriched with oxygen. The blood then returns to the left side of the heart, from where it is pumped through the aorta into the body to supply all tissues with oxygen-rich blood.

The ductus arteriosus is a vessel that connects the pulmonary artery with the aorta during embryologic development. It serves as a detour to bypass the lungs. It usually closes after birth. In some dogs, this vessel fails to close. This condition is referred to as “Patent Ductus Arteriosus (PDA)”. With this condition, a certain amount of blood flows from the aorta into the pulmonary artery. This is called a “Left-to-Right-Shunt” (L-R). It leads to an overflow situation in the lungs and also of the left heart. If PDA is not treated by occlusion of the persistent vessel as soon as possible, the animal will die.

In rare cases the blood flows in the opposite direction – from the pulmonary artery into the aorta, without being oxygenated in the lungs. This is called a “Right-to-Left-Shunt” (R-L) or a reverse PDA. With a R-L shunt, the body tissues of affected animals are not supplied well with oxygen. This less common variation cannot be treated surgically.



The cause of PDA is most likely genetic and is heritable in the poodle and Welsh corgi. Other breeds such as collies, pomeranians, German shepherds, bichons, and Yorkshire terriers are also frequently affected. Animals diagnosed with PDA should not be bred. This will prevent the birth of other affected animals.



Veterinary Specialists of Alaska, P.C. Client Information Sheet: Patent Ductus Arteriosus (PDA)

The clinical signs in an animal with L-R-shunt or PDA can include fatigue, dyspnea (abnormal breathing), exercise intolerance, lethargy, poor appetite, weight loss, and discomfort. Affected puppies are usually smaller than litter mates. Sometimes one can feel a vibration on the chest wall. This is the murmur. A murmur is turbulence in the blood within the heart. A PDA murmur is very characteristic in that it is loud and sounds like a steam engine or a washing machine. It is called a “machinery” murmur. With R-L shunt, or reverse PDA, where the blood is not oxygenated in the appropriate manner, animals show hind leg weakness and debilitating exercise intolerance. These animals have no murmur.

The diagnosis of PDA can be made with a thorough physical and neurological examination, blood tests and radiography (x-rays). Ultrasonographic examination of the heart is the best test. With R-L shunt, blood tests show an increase in the amount of red blood cells. This is because the body wants to carry more oxygen to the body cells. This phenomenon is called “polycythemia”.

Treatment should be performed preferably between 8 to 16 weeks of age. L-R shunts are traditionally treated by surgical ligation (tying off) of the persistent blood vessel. This is a very delicate procedure. The surgeon works very close to the moving heart, and an error in technique may lead to immediate death on the surgical table. Therefore it is important that this procedure is performed only by appropriately trained surgeons. Alternative procedures can be performed in specialty centers and include obstruction of the vessel, using specifically designed devices that are introduced through an artery in the leg, and then advanced to the patent vessel. R-L shunts cannot be treated with surgery. Ligation is contraindicated because it would lead to excessive pressures in the right heart, with life-threatening consequences. Further details concerning treatment will be discussed during your appointment with the board- certified surgeon at VSOA.

After surgery, the animals usually improve immediately. The specifics for post operative care may differ between patients, and will be discussed at the time of discharge. However, some animals require placement of a chest tube to allow for continuous evacuation of air from the chest. These patients may need to be monitored in a critical care clinic for several days. In all patients, activity limitation to brief leash walks is mandatory for 4-6 weeks to allow the body to adapt to increased blood pressure.

The prognosis is excellent in most cases of L-R shunts, if surgery is performed early. Animals with R-L shunt can be treated supportively, but long term survival and good quality of life are generally poor.

Hopefully this information pamphlet was helpful to help you. Please do not hesitate to call or ask at your next appointment if you have any questions or concerns.

Your VSOA Team.