



Pulmonic Stenosis

What is it?

Pulmonic stenosis is one of the most common congenital heart defects in dogs. It consists of a malformation of the Pulmonic valve leading to obstruction to the flow of blood from the heart into the lungs. This is a hereditary condition, hence breeding of affected animals is highly discouraged.

How is it diagnosed?

Detection of a heart murmur during the first few visits to the vet are the first step for diagnosis. Presence of a heart murmur should always prompt for an examination by a cardiologist, even if the murmur is not very obvious or intense. On some occasions heart murmurs are present in normal hearts – the so-called “innocent murmurs”. These murmurs are related to the development of cardiac structures during growth and are completely benign. Nevertheless, they cannot be distinguished from murmurs caused by heart disease only by listening with a stethoscope. A complete Doppler ultrasound scan of the heart – echocardiographic examination – is necessary for diagnosis.

What signs/symptoms may I notice?

Very frequently no signs of disease are present in the first few months to years of life except in severe cases. This constitutes one of the main reasons for its late diagnosis in most cases. In mild cases, clinical signs may never occur throughout life. In moderate to severe cases fatigue, exercise intolerance and collapse (syncope) may be noticed, especially during episodes of excitement, exercise or fear.

What are the differences in severity of Pulmonic stenosis?

Severity is assessed via a Doppler ultrasound examination. This estimates the pressure which the heart is subjected to by the presence of the obstruction. Normal pressures within the right ventricle are usually under 30 mmHg.

Mild stenosis: Pressure < 50 mmHg

In these cases life expectancy may be normal and clinical signs may never be observed throughout life.

Moderate stenosis: Pressure > 50 mmHg and < 80 mmHg

Some dogs may cope well with the disease and some may not. The heart is chronically subjected to higher stress than normal and forced to work more than it should. The heart muscle will become thicker in order to compensate for this increased effort. Clinical signs may occur at any point throughout life.

Severe stenosis: Pressure > 80 mmHg

Dogs with severe stenosis are at increased risk of clinical signs, heart failure and even death.

Can it be treated? Is there a cure?

Unfortunately, there is no cure for pulmonic stenosis. However, there are some options to help improve or control the disease. Medical treatment with drugs called beta-blockers are usually employed to try and “protect” the heart muscle and reduce the occurrence of electrical instability – arrhythmias – and possibly sudden death. A more definitive treatment consists in trying to reduce the obstruction by a minimally invasive procedure called balloon valvuloplasty. This procedure is performed in specialised cardiology referral centres and consists of advancing a catheter with a balloon on the tip through a vein in the neck or the leg up to the heart. The balloon is dilated at the level pulmonic valve rupturing the fused valve cusps in an attempt to reduce the obstruction.

More about Balloon Valvuloplasty

Is it safe?

This procedure is quite safe when performed by an experienced individual. As you can understand, these procedures are very delicate and one must be aware of all possible complications. The more severe the case, the higher the risk of significant complications, but complications may occur even in the most straightforward cases. With the exception of high-risk patients, risk of death is very low.

Possible significant complications include the occurrence of life-threatening arrhythmias, which must be dealt with swiftly and on very rare occasions, may result in death during the procedure. The use of beta-blockers (normally given ahead of the procedure) reduces this risk. Although a rare occurrence, presence of catheters and wires within the blood vessels and the heart risks damage to these structures and, at worst, rupture and internal haemorrhage, which could result in death or may require urgent surgical repair with open-chest surgery.

Less serious complications such as haemorrhage at the incision site and arrhythmias may occur in about 5% of the cases.

Is it definitive?

Re-formation of the narrowing may occur in up to 10% of cases and a second procedure may be necessary. This usually occurs several weeks to months after the procedure and is not possible to foresee.

Is it possible to perform in all cases? No. The procedure may not be possible and may be abandoned if severe thickening of the heart muscle does not allow passage of the catheters up to the pulmonic valve or if the risk of life-threatening arrhythmias is perceived to be high. In some cases, detection of an abnormal coronary artery close to the pulmonic valve during the procedure, may be another reason to abandon the intervention due to the risk of rupture resulting in death.

Is it effective?

This procedure is effective in about 80% of the cases. Ideally, pressure in the right ventricle is reduced to half of the initial pressure or less than 80 mmHg. Balloon valvuloplasty is more effective in type A pulmonic stenosis than type B.

“Dogs with severe pulmonic stenosis live longer when balloon valvuloplasty is successfully performed.”

What else should I know?

Presence of concomitant congenital heart defects

Pulmonic stenosis is frequently associated with other heart defects, such as aortic stenosis (27% of cases) and ventricular septal defect (17% of cases) among others. Aortic stenosis means that there is also an obstruction to the aorta, the artery leaving the left part of the heart that carries blood to the whole body except the lungs.

The relevance of the presence of these defects and its impact on treatment of Pulmonic stenosis will be discussed by the cardiologist attending your dog.

Bibliographic references

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