Subaortic Stenosis (SAS)

What is it?

Subaortic stenosis is a common cardiac disorder in many large dog breeds, including the Newfoundland. It is characterized by a restriction of blood flow from the left ventricle of the heart through the aorta. The decreased blood flow is the result of a stenotic ring below the aortic valve, decreasing the diameter of the left-ventricular outflow pathway.
In moderate and severe cases, this can cause life-long problems, including sudden death.

What causes it?

Subaortic stenosis is thought to be primarily of genetic origin in the Newfoundland. Even so, it is not a simple thing to breed against. It was originally classified as dominant with incomplete penetrance, meaning that only one parent need contribute the defective gene to produce the disease, but dogs with the defective genotype do not necessarily develop SAS.

Signs & Symptoms

Most signs and symptoms are consistent with cardiac insufficiency, e.g. exercise intolerance, difficulty breathing, etc. However, even severely affected dogs may show no signs for a few years, only to be followed by sudden death from a cardiac arrhythmia.

SAS is usually graded as mild, moderate or severe. It is important to distinguish these grades vs rating of murmurs. A heart murmur is a symptom, not the disease. Murmurs are often graded from I to VI.

Testing

The most definitive test for SAS is an echo-cardiogram. During this ultrasound test, the blood flow through the heart, velocity through, and pressure across the aortic valve can be characterized. The most common, standardized criteria are either pressure readings or velocity. These are mathematically related, so they are really both measurements of the disruption of normal blood flow. With a mildly* affected dog (and some moderately affected) we can expect to see a normal life-span with few, if any, activity restrictions. With moderate to severe, treatment with a beta-adrenergic blocker will usually be prescribed and is believed to increase the post-diagnostic life span and quality of life by decreasing the work-load of the heart and reducing the probably of turbulent blood flow resulting in fatal arrhythmias.

Experimental Treatment:

Experimental treatment with balloon valvoplasty has been tried. In theory, this would widen the Left-ventricular outflow pathway, decreasing the pressure gradient and decreasing velocity. Though initially improving pressure measurements, the treatment did not increase lifespan. More recently, a cutting balloon valvoplasty has been attempted. With this technique, the stenotic ring is scored with very sharp blades incorporated in the balloon valvoplasty. Initial results are promising, though not well characterized yet and the instrumentation for the echnique is very expensive.

Prevention:

By far the most important prevention is via selective breeding. Even very mild dogs with no symptoms and good quality of life should not be bred. Most SAS puppies can be detected by 10-12 weeks, particularly if echo-cardiogram is used. It is important that breeders clear their puppies at 10-14 weeks with a veterinary cardiologist before placement. For the breed the most important thing is a full cardiac clearance at more than a year of age in breeding dogs, prior to breeding.

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