

# Atrioventricular Valve Degeneration in Dogs

Rebecca E. Gompf, DVM, MS, DACVIM (Cardiology)

## BASIC INFORMATION

### Description

The left atrioventricular (AV) or mitral valve lies between the left atrium and the left ventricle. The right AV or tricuspid valve lies between the right atrium and ventricle. These valves keep blood from flowing backward into the atria when the heart contracts.

As these valves age, deposits occur and they become scarred (myxomatous degeneration), which causes them to leak when the heart pumps. As a result, the heart is less efficient in pumping blood and slowly enlarges. If the leakage is minor, the heart usually compensates, but as the leakage worsens, heart failure can develop. The mitral valve is most commonly affected and mitral degeneration may eventually lead to left-sided heart failure.

### Causes

The cause of the myxomatous degeneration is unknown. AV valvular disease is the most common heart disease in dogs. It most commonly affects small to medium-sized breeds, especially the papillon, poodle, Chihuahua, dachshund, and Cavalier King Charles spaniel.

AV valvular disease is common in older dogs. The disease tends to develop at a younger age and progresses more rapidly in male dogs than in females. Genetic factors play a role in this disease, but other conditions (level of exercise, obesity, diet) may influence the severity of the problem.

### Clinical Signs

The leaking valve often causes a heart murmur that can be detected on a routine physical examination before signs occur. The first clinical sign is usually coughing that is triggered by excitement or exercise. As the left heart enlarges, signs of heart failure may develop, such as more severe coughing, restlessness and pacing at night, inability to exercise normally, and rapid, labored breathing.

Dogs that go into right heart failure may also cough, but more often they tire while exercising, lose weight and muscle mass, and develop fluid in their abdomen. Eventually fluid also builds up in the chest, and they have trouble breathing.

### Diagnostic Tests

Heart murmurs are often graded in severity based on how loud they are. Low-grade murmurs require monitoring over the course of the dog's life. If the murmur changes rapidly or reach a more severe grade, if the dog develops clinical signs, or if irregular heart rhythms are detected, then tests may be done to evaluate the heart and other organs, such as:

- Chest and possibly abdominal x-rays
- Echocardiogram (heart ultrasound)
- Electrocardiogram (ECG), especially if an irregular rhythm is detected
- Laboratory tests

Some dogs that are in severe distress from left heart failure require stabilization before testing is done.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Treatment is usually started after clinical signs develop, because no drugs have yet been found that stop progression of this disease. Dogs with mild signs may be treated on an outpatient basis, but more severely ill dogs require hospitalization. A number of drugs are available for stabilizing heart failure, including injectable diuretics (such as furosemide) to decrease fluid in the lungs, vasodilators (such as nitroglycerine ointment, nitroprusside, or hydralazine) that decrease the heart's workload, and oxygen therapy. Some fluid may be drained from the chest cavity or abdomen.

After heart failure is stabilized, long-term oral medications are started. Some of these drugs may also be used in dogs with mild clinical signs.

- Furosemide may be continued indefinitely and may be combined with other diuretics, such as spironolactone.
- Angiotensin-converting enzyme (ACE) inhibitors, such as enalapril, benazepril, or ramipril, may be used to improve the quality of the dog's life and help reduce fluid retention.
- Pimobendan is a newer drug that helps relieve the workload of the heart and improves the heart's contractions. It is reserved for dogs in heart failure.
- Other drugs (digoxin, beta-blockers, calcium channel blockers) may be started for high heart rates associated with abnormal rhythms such as atrial fibrillation.

In addition to drug therapy, dogs with heart failure should not be fed salty foods, and low-salt diets may be used to limit salt intake. Although strenuous exercise is avoided, mild to moderate exercise may be done based on guidelines from your veterinarian.

### Follow-up Care

Dogs with no clinical signs are commonly monitored with physical examinations every 6-12 months and yearly chest x-rays. If your dog develops problems breathing, notify your veterinarian immediately. Intensive monitoring is needed during hospitalization for heart failure. Following discharge, periodic recheck visits and testing are needed for the rest of the dog's life.

### Prognosis

Dogs with asymptomatic disease may live for years without developing clinical problems. The more severe the leak in the valve and the bigger the left atrium, the more likely it is that the dog will develop heart failure. The average survival time for dogs with heart failure is 8-10 months, but every dog varies in how it responds to treatment. Dogs with other diseases, such as kidney failure, tend to do poorly.

Cavalier King Charles spaniels and other small dogs that develop AV valve degeneration before 5 years of age should not be used for breeding.