MALTMAN COSHAM VETERINARY CLINIC

## Hypertrophic cardiomyopathy in cats

Hypertrophic cardiomyopathy, or HCM, is a disease seen almost exclusively in cats. It involves a thickening of the normal muscle of the heart wall, which can be generalised or more patchy. The exact cause is not fully understood but it is thought that it relates to a mutation in the patient's genetic code – this can be inherited in which case it is present as a predisposition from birth, but equally it can happen at some point later in the animal's life as a new mutation.

About 12.5% of cats have a heart murmur associated with disease of the heart and the vast majority of these will have some degree of HCM. For many, HCM is almost a variation of normal and they will not experience symptoms from it and only die many years later of another cause. However, in some cases, it will lead to congestive heart failure, arrhythmias, thromboembolism and death. Unfortunately, at the moment, we do not have a mechanism to be able to predict which animals will fall into the more serious group.

When HCM causes illness, the heart wall is thickened. This is seen as an outwards enlargement, but also as a narrowing of the internal dimensions of the left ventricle as the thickening moves inwards. This means that during the resting phase, when the heart is not contracting and is supposed to be filling with blood for the next heartbeat, the amount of blood that can enter the ventricle is reduced as there is less room. Hence, there is less blood to be ejected into the aorta and around the body when the next beat comes. This is exacerbated by the fact that the outflow tract through which blood leaves the heart is often also narrowed and so blood cannot flow out of the heart efficiently.

There are two effects of this: firstly, the body is deprived of its full supply of oxygen and nutrients and, secondly, the blood which cannot leave the heart is squeezed back into the left atrium which becomes engorged with blood and expands.

Ultimately, as disease worsens, the effects of oxygen deprivation on the body are seen as exercise intolerance, inappetence and weight loss, whilst blood returning from the lungs is impeded so that the lungs become congested with fluid (called pulmonary oedema) and the cat may find it difficult to breathe.

The problem knocks on to the right side of the heart - higher pressures prevent blood returning from the body from coming in. This fluid accumulates in the space surround the lungs (pleural effusion), in the abdomen (ascites) and occasionally under the skin of the lower legs.

The body attempts to correct the problem by asking the heart to beat harder and faster, whilst contracting blood vessels, which all make the blood pressure go up to force continued supply to tissues. Various hormones are active to help this process as well as stimulate the retention of water in the kidneys to keep circulating volumes higher. Unfortunately, when the heart beats faster, the time available between beats for filling with blood prior to the next beat is reduced and this further compromises the amount of blood which is able to enter the ventricle to be pumped round the body on the next beat. These counter mechanisms work up until a point and ensure the tissues remain supplied with blood, but after this point they become counterproductive and simply mean that the heart has to work harder and harder. Fluid accumulates in the lungs, chest and abdomen when the heart cannot cope any longer.

Examination will reveal a heart murmur, with or without crackles on the lungs which equate to fluid. The disease is the most common cardiac problem seen in cats, which may lead to a presumptive diagnosis.

Investigation will include chest x-rays and heart ultrasound (echocardiography) to assess the size and function of the heart and its valves. The thickened muscle is usually easy to identify. In most cases, an ECG will be taken to assess whether the rhythm of the heart is normal and blood work will be done to see how the rest of the body is coping with reduced oxygen supply.

As mentioned above, it is impossible to identify which cats with a heart murmur and a diagnosis of HCM will go on to develop clinical disease. It is also not clear which, if any, treatments will help to stop those that are going to develop symptoms from doing so. However, I do feel that in the years since cats with heart murmurs have been routinely investigated and treated with logical drugs, I have seen a reduction in the number of cats developing congestive heart failure or thromboembolism and so, until data is available which disproves the theory, I feel it is prudent to treat prior to the onset of heart failure. In general, all cats with HCM can be medicated as a precaution as side effects are few and cost is minimal for most of the drugs concerned. Currently, it seems preferable to medicate them all than to wait to find out which really need it, by which time it is probably too late to effect real change for these individual patients. Treatments used will vary from case to case, but may include one or two of the following: beta-blockers, calcium channel blockers, ACE inhibitors and/or aspirin.