

## HCM-screening under sedation

HCM (Hypertrophic Cardiomyopathy) is a disorder of the cardiac muscle that by now has been diagnosed in many breeds of cats. At this moment in one breed only, the Maine Coon, one gene defect has been found that causes HCM. But in all probability, just like with human beings, various genetic defects are responsible for this disorder; a Danish researcher is said to have located a second responsible genetic defect (this time with a Norwegian Forest Cat in a research not published as yet). So for the time being echo-screening will continue to be the most important instrument for early detection of this disease.

As an internist I specialized in cardiology/echocardiography and since 1996 I have been doing echo-screenings for HCM. At first mainly with patients having clinical complaints in my specialist clinic for domestic animals, but later, since 1999, I have been examining breeding animals as part of breed screening research. Some time ago I switched to screening under sedation, especially with stressed animals. Discussions on various cat forums on the Internet show that there are many questions on the how and why of HCM-screening under sedation. Therefore the biggest independent Dutch cat club NEOCAT asked me to broadly outline my procedure. A request that I'm happy to comply with.

### The how and why of sedation

HCM can present itself in various ways: as thickening of the partition between the left and the right chamber (the septum), as thickening of the papillary muscles or as local thickening in the septum, the wall of the left chamber or the tip of the heart (apex). Though HCM presents itself in the left half of the heart mostly, there can also be changes in the right part! And finally there are combinations of both.

I carried out the first examinations without sedation, lying, and with ECG. However, I soon became aware of the huge variation in temperament of the cats that were to be examined, the relatively high heart rates during the examination and the effect of all of this on the quality of the creation of the image. When a cat shows big changes of the cardiac muscle that isn't a problem, but when the animal showed more subtle changes (such as described above) these couldn't, measured according to my own criterion, be shown with sufficient reliability.

For that reason I started to look for a method that could result in the quality I wanted. I decided to fit the cats that were to be examined with an intravenous catheter. Through this catheter or cannula I administer a light sedation which puts the cats to sleep within 60 seconds. By adding small quantities of the anaesthetic as the examination continues, the cats needn't be kept asleep longer than necessary. The combination of a quieter heartbeat and the fact that the cat is lying motionless, enables me to make fine, reproducible images. A few minutes after the administering of the anaesthetic has stopped, the cat regains consciousness again. After circa 15 minutes the owner can take the cat home. This way of working is safe and hardly taxing for the cat, pleasant for the owner and it enables me to do my job well. Owners are often enthusiastic about the quiet conditions under which the examination is carried out. The technique also proved its right to exist as part of examinations where second opinions are being sought, which are regularly being carried out at De Kompaan's.

### Does sedation influence the results of the examination?

With the echo screening for HCM as we have been carrying out for years, we are mainly searching for the above-mentioned visible, **anatomical defects** of the cardiac muscle. These changes aren't influenced by sedation. In my view they can be shown even better with the animal lying quietly with a quiet heartbeat. Meanwhile Prof. Dr. Mark Kittleson of the University of Davis has also carried out the echo screening under sedation in one of his latest HCM studies: he too wanted to obtain reliable, reproducible results to compare them with a different technique of examination (MRI).

**Functional changes** of the heart (changes in the pump function of the heart, which are the *effect* of the anatomical changes) however, can be influenced by sedation. When there are indications for this, that part of the examination is carried out without sedation. We are then talking about current speeds in the various compartments and arteries and TDI (Tissue Doppler Imaging: a method with which the motility of the left wall can be defined).

### Conclusion

HCM-screening can be carried out in diverse ways. In order to get a result that is as reliable as possible and also repeatable, at De Kompaan I prefer to carry out the HCM-screening under standardized conditions: under light sedation, lying, with ECG and when required supplemented by examinations on the right and/or TDI.

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