

Neuroendocrine/Chemoreceptor Tumors - Chemodectomas

(For other neuroendocrine tumors see handout “Neuroendocrine Tumors – Carcinoids”)

These notes are provided to help you understand the diagnosis or possible diagnosis of cancer in your pet. For general information on cancer in pets ask for our handout “What is Cancer”. Your veterinarian may suggest certain tests to help confirm or eliminate diagnosis, and to help assess treatment options and likely outcomes. Because individual situations and responses vary, and because cancers often behave unpredictably, science can only give us a guide. However, information and understanding for tumors in animals is improving all the time.

We understand that this can be a very worrying time. We apologize for the need to use some technical language. If you have any questions please do not hesitate to ask us.

What are neuroendocrine cells and chemoreceptors?

Neuroendocrine cells produce specialized chemical substances called “neuroendocrine hormones”. Neuroendocrine hormones interact with the nervous system and other hormones to integrate and co-ordinate a wide variety of activities to maintain internal stability of the body.

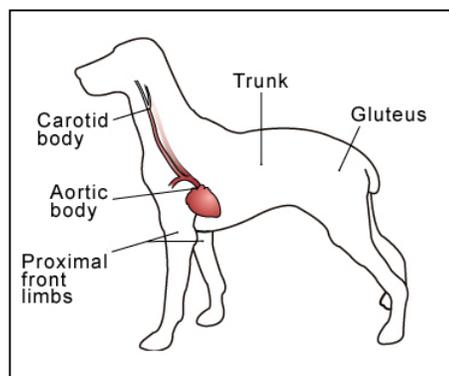
Chemoreceptors are neuroendocrine cells sensitive to changes in blood carbon dioxide, oxygen and acidity. They are widely distributed in the body but tumors develop principally in the aortic and carotid bodies in domestic animals. The carotid body is in the neck. The aortic body is at the base of the heart. They formed from multiple small collections of cells with nervous tissue embedded in the outer walls of the carotid artery and aorta.

What are chemodectomas?

Chemodectomas are tumors of the chemoreceptors. They include both benign (non-spreading) adenomas and malignant carcinomas. Malignant tumors are locally invasive and approximately 30% metastasize to other sites in the body. Both benign and malignant tumors are difficult to remove surgically as they wrap round major blood vessels. Tumors may be multiple.

What do we know about the cause?

The reason why a particular pet may develop this, or any cancer, is not straightforward. Cancer is often seemingly the culmination of a series of circumstances that come together for the unfortunate individual.



Chemodectomas are most common in short-nosed dogs so it is suggested that low oxygen concentrations combined with a genetic predisposition are causes of the cancers. Further evidence for this theory is that people who live at high altitudes have ten times as many of these tumors as people who live at sea level. This implies that prolonged stimulation of the cells of the gland is the major cause of development of this type of cancer. Cancer induction is a multi-step process called tumor progression. Some cancers never progress past the first stages so remain benign. Others progress rapidly. There is a continuous spectrum from benign to malignant cancer.

Why has my animal developed this cancer?

Some animals have a greater tendency (genetic susceptibility) to cancer. Some breeds have far more cancers than others, often of specific types. The more divisions a cell undergoes, the more probable is a mutation so cancer is more common in older animals.

Are these common tumors?

These are all rare tumors, primarily recognized in dogs and infrequent in cats. Chemodectomas have a breed predilection for short-nosed dogs, particularly the Boxer and Boston terrier. Most are eight years of age or older and males are more often affected than bitches. Tumors are most common in the aortic body but in 65% of cases there are tumors in both carotid and aortic bodies.

How will these cancers affect my pet?

Chemodectomas are non-functional as neuroendocrine cells so clinical problems are primarily associated with their enlargement and consequent compression of the adjacent organs. Carotid body tumors interfere with swallowing and compress the large veins of the neck. Aortic body tumors compress the major blood vessels around the heart so produce signs otherwise associated with cardiac disease (shortness of breath, coughing, and soft swelling of the tissues under the skin of the neck).

How are these cancers diagnosed?

The swelling in the neck indicates a problem in the case of carotid body tumors. Specialized aortography or echocardiographic techniques may indicate aortic body tumors. Accurate diagnosis and therefore prediction of behaviour (prognosis) rely on microscopic examination of tissue (histopathology). This is done at a specialized laboratory by a veterinary pathologist. The piece of tissue may be a small part of the mass (biopsy) or the whole lump. These tumors break up easily because they are highly vascular. They also wrap around large blood vessels so it is rarely possible to assess whether the cancer has been fully removed.



Ultrasound Machine



What types of treatment are available?

Treatment is surgical removal of the lump(s).

Can these cancers disappear without treatment?

It is not common, but the loss of blood supply to a cancer can make the cells die. Unfortunately, the disappearance of the cancer is rarely complete.

How can I nurse my pet?

After surgery, you will need to prevent your pet from interfering with the operation site, which needs to be kept clean. Any loss of stitches or significant swelling or bleeding should be

reported to your veterinarian. If you require additional advice on post-surgical care, please ask.

How will I know how the cancer will behave?

Histopathology will give your veterinarian the diagnosis that helps to indicate how it is likely to behave. The veterinary pathologist usually adds a prognosis that describes the probability of local recurrence or metastasis (distant spread).

When will I know if the cancer is permanently cured?

'Cured' has to be a guarded term in dealing with any cancer.

In 65% of cases, there are concurrent carotid and aortic body tumors so both benign and malignant tumors present surgical problems as they envelop major vessels. Total cure is therefore uncertain even when tumors are benign.

Aortic body tumors grow slowly and exert pressure on the large vessels. Malignant tumors often invade the heart and adjacent vessels. When they metastasize, secondary foci are most frequent in the lung and liver. The histopathology report should indicate whether this is probable in your pet.

Carotid body tumors are more malignant than aortic body tumors and metastasize (spread elsewhere in the body) in approximately 30% of cases. Metastases may be in the lung, lymph nodes and other organs.

Are there any risks to my family or other pets?

No, these are not infectious tumors and are not transmitted from pet to pet or from pets to people.

*This client information sheet is based on material written by Joan Rest, BVSc, PhD, MRCPath, MRCVS.
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