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Mast Cell Tumors in Cats

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 about tumors and their treatment in animals is improving all the time.

We understand that this can be a very worrying time. If you have any questions please do not hesitate to ask us.

What is a mast cell?

Mast cells originate or are formed in the bone marrow but complete their maturation in peripheral tissues. They are found in all tissues of the body but are concentrated in the skin, respiratory tract and digestive tract. Mast cells produce many chemicals with differing effects on the body (histamine, proteoglycans, neutral proteases and chemotactic growth factors). These chemicals are present in granules in the cytoplasm of mast cells. Mast cells release their granular contents in response to various stimuli, inducing an inflammatory reaction. In addition, mast cells interact with cells of the immune system that produce allergic type antibodies (IgE), by presenting foreign molecules (antigens) to immune system cells and by recruiting certain cells (phagocytes) to engulf foreign or invading material. As well as being a cellular barrier to external agents, mast cells have a regulatory function on cutaneous nerves, blood circulation, fibrous tissue and other immune cells. They are therefore important in allergic responses, tissue remodelling, wound healing and non-allergic skin diseases. Mast cells in hair follicles also help to regulate the cyclical activity of those follicles.

Not surprisingly, with all these functions, mast cells are not a single cell type.

What is a mast cell tumor?

This is a tumor originating from the cat's mast cells. The tumors include both benign (non-spreading) and malignant (life threatening, spreading) types. Many are multiple. Recurrence of some tumors is possible but spread to other parts of the body (metastasis) is unusual in the cat.

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 the culmination of a series of circumstances that come together for the unfortunate individual.

The cause of mast cell tumors in cats is unknown. For humans, research has indicated that abnormalities of certain receptors (key-lock mechanisms) on the surface of mast cells may contribute to some of these tumors. Other causes are overproduction of body factors that stimulate mast cell proliferation (such as Stem Cell factor, SCF); and cellular genetic mutations and gene malfunctions. Details of these are beyond the scope of these notes. There is variability in the behavior of mast cell tumors because they are genetically varied.

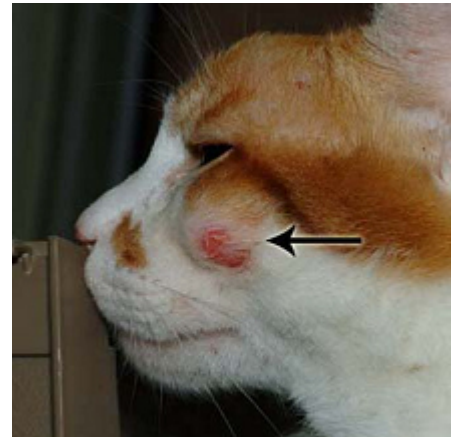


Image courtesy of Jan Hall, BVM&S, MS,
MRCVS, DipACVD, Clinical Dermatology,
Ontario Veterinary College

Is this a common tumor?

"Mast cell tumors are less common in cats than in dogs."

Mast cell tumors are less common in cats than in dogs although cats have more mast cells in the skin compared with dogs. Cats with mast cell tumors are usually over four years of age but any age can be susceptible including kittens. The tumors often occur at multiple sites within the same cat but most are benign (non-life-threatening, non-spreading). Occasionally mast cell tumors involve internal organs such as liver, spleen and lungs.

"Mast cell tumors are particularly common in Siamese cats."

Mast cell tumors are particularly common in Siamese cats and this breed has a specific variant called the histiocytic mast cell tumor.

How will this cancer affect my pet?

In the cat, most mast cell tumors are noted as firm plaques (hard, flattened areas) or nodules (small lumps) in the skin. There may be itching because the tumors produce substances that induce inflammation.

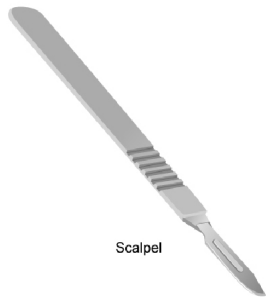
Weight loss due to loss of body fat and muscle may occur in malignant forms of cancer that have spread and there may be illness secondary to production of inflammatory substances by the tumor.

How is this cancer diagnosed?

Pre-surgical cytology (microscopic examination of small samples of cells obtained by aspiration or fine needle biopsy) can help to identify some mast cell tumors and plan surgery. More accurate diagnosis and assessment of excision margins (the borders between tumor and surrounding normal healthy tissues) relies upon microscopic examination of the whole tumor (histopathology), which is done at a specialized laboratory by a veterinary pathologist.

The histopathology report typically includes words that indicate whether a tumor is 'benign' (non-spreading, local growth) or 'malignant' (life-threatening, capable of spreading to other body sites). This, together with the origin or type of tumor, the grade (degree of resemblance to normal cells or 'differentiation') and stage (how large it is and extent of spread) indicate how the cancer is likely to behave. If your veterinarian submits the entire lump of excised tissue, the veterinary pathologist can also indicate the likelihood that the cancer has been fully removed.

What types of treatment are available?



"Surgery is the treatment of choice whenever possible."

Surgery is the treatment of choice whenever possible. Treatments with drugs (chemotherapy) or radiation are of uncertain outcome, have side effects and are only used after careful consideration and discussion.

If your cat experiences any gastrointestinal side effects of the mast cell tumor (due to release of chemical substances from the mast cell granules), these can be treated symptomatically with hydrogen ion receptor antagonists such as cimetidine, or calcium channel blockers such as omeprazole.

Can this cancer disappear without treatment?

Some mast cell proliferations are not neoplastic but are temporary overgrowths (hyperplasia) and may disappear even when they are present in lymph nodes. Cats also have large numbers of mast cells in some inflammatory reactions. These are not neoplastic but they can cause severe urticaria (wheals, rash, hives) and pruritus, which are poorly responsive to treatment. Young related Sphinx cats have also been diagnosed with skin infiltrations of mast cells associated with pruritic papules (very small lumps) and plaques.

"Well-differentiated multiple tumors in kittens (sometimes known as "mastocytosis") may regress spontaneously."

Well-differentiated multiple tumors in kittens (sometimes known as "mastocytosis") may regress spontaneously.

Mastocytosis may be a hyperplasia. Occasionally (even at a few weeks of age), a kitten may develop hundreds of similar lesions. The behavior of multiple tumors in older cats is uncertain.

Histiocytic mastocytomas in Siamese cats are often multiple and regress spontaneously.

Poorly differentiated mast cell tumors do not disappear spontaneously.

How can I nurse my pet?

Preventing your cat from rubbing, scratching, licking or biting the tumor will reduce itching, inflammation, ulceration, infection and bleeding. Any ulcerated area needs to be kept clean.

After surgery, the operation site needs to be kept clean and your pet should not be allowed to interfere with the site. Report any loss of sutures or significant swelling or bleeding to your veterinarian. If you require additional advice on post-surgical care, please ask.

When will I know if the cancer is permanently cured?

"Cure" has to be a guarded term in any cancer. However, with mast cell tumors, absence of recurrence or spread for more than 6 months after surgery is a favorable sign.



"Absence of recurrence or spread for more than 6 months after surgery is a favorable sign."

Histopathology, with the associated pathology report will give your veterinarian the diagnosis of tumor type and status that helps to indicate how the tumor is likely to behave. The veterinary pathologist usually adds a prognosis that describes the probability of local recurrence or metastasis (distant spread).

Well-differentiated, benign, solitary mast cell tumors are cured by surgical removal, even in elderly cats. However, there is a tendency for cats to develop multiple, apparently primary, sequential mast cell tumors, some of which are benign and some not. Multiple tumors disappear within a few months in young cats but the situation in older cats is less certain.

Some feline mast cell tumors have features indicating potential malignancy. Multiple tumors are common and the tumors usually recur or spread to other sites in 2 to 3 months. Tumors often involve the lymph nodes but do not necessarily spread to internal organs or other sites. The presence of tumors in the internal organs does not necessarily imply metastasis from a cutaneous site; many arise *de novo*, or spontaneously. The precise features that are most prognostic for malignant behavior are still uncertain.

Histiocytic mast cell tumors are usually found in young Siamese cats and they regress spontaneously within two years but then can recur in multiple crops of 1/8 – 1/4 inch nodules.

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 pet to people.

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