

# Mast Cell Tumors

## ABOUT THE DIAGNOSIS

Mast cell tumors are growths that commonly affect the skin of dogs and, less commonly, cats. They are potentially serious, since some mast cell tumors are malignant (cancerous). However, many mast cell tumors are benign (not malignant), and additionally, there are many, many other types of benign skin growths that can occur that resemble mast cell tumors outwardly but are in fact different. It is not possible to tell with the naked eye alone whether a specific skin growth is a malignant mast cell tumor or not, and therefore, some diagnostic tests are always necessary to confirm whether a skin growth is a mast cell tumor.

A mast cell tumor is often a surprising diagnosis to pet owners and family members because these tumors often seem unremarkable: they simply look like innocuous skin masses or, if affecting internal organs, are hidden from view. In this way, mast cell tumors are misleading because they may become serious or devastating health concerns if not identified and eliminated early on.

While most mast cell tumors affect the skin (cutaneous mast cell tumors), sometimes they may affect internal organs (visceral mast cell tumors). In cats, for example, up to 50% of mast cell tumors occur in the spleen, whereas this form is rare in dogs. Another uncommon form is mast cell tumor of the intestines. Unlike mast cell tumors affecting the skin, which are visible as skin growths, visceral mast cell tumors generally produce vague symptoms, and the diagnosis is only reached after extensive testing.

When mast cell tumors of the skin are more advanced or aggressive, they may spread to the internal organs, producing a combination of both cutaneous and visceral mast cell tumors. For this reason, if your veterinarian identifies a skin growth as being a mast cell tumor, he/she may recommend assessing the internal organs further to screen for internal mast cell tumors.

Most dogs and cats developing mast cell tumors are middle-aged or older adult pets. Of the various dog breeds, boxers and Boston terriers are more likely than average to develop mast cell tumors in general, and Siamese cats are predisposed to mast cell tumors of the skin.

Mast cells, which make up the bulk of the tumor tissue in these masses, contain histamine, heparin, and other substances that are responsible for the specific problems associated with these tumors. These substances, called vasoactive agents, cause tissue damage by making blood vessels (like veins and capillaries) dilate and become “leaky.” When the substances are released from mast cell tumors, which happens either spontaneously or when a mast cell tumor is firmly touched or handled, the affected tissues become swollen and warm within a few minutes—the classic inflammatory response. This reaction is a result of the action of the substances released from the tumor this way. The tissue reaction and inflammation may occur directly around the tumor in cases of mast cell tumors of the skin, or if large amounts of these substances are released into the bloodstream, blood vessels may dilate in the entire body, resulting in extremely low blood pressure and possibly a state of hypotensive shock. This is similar to the response seen in severe allergic and hypersensitivity (anaphylactic) reactions. Therefore, a skin growth, lump, or mass on a dog or cat should not be handled unnecessarily until it has been brought to veterinary attention and properly evaluated, in case it is a mast cell tumor.

**CLINICAL SIGNS:** Frequently, mast cell tumors of the skin will be noted as small lumps that have not changed for a long time, but which suddenly become larger. Sometimes the lump will appear red and inflamed. It is worth remembering that many, many other types of skin growths (be they malignant or benign) can behave this way, too, and that an enlarging skin growth is a good reason for a veterinary visit but no reason for premature concern. Less commonly, when a mast cell tumor affects the internal organs, the main symptom may be vomiting (because the vasoactive chemicals the tumors release can cause nausea) or vague signs of not feeling well such as decrease or loss of appetite or loss of energy/sluggishness.

**DIAGNOSIS:** Mast cell tumor of the skin can be diagnosed by a fine-needle aspirate. With this minimally-invasive technique, a very thin needle is inserted into the growth to remove some cells from the tumor tissue for microscopic examination. The procedure is not painful, and no anesthetic is generally required, since the needle itself is of the same small size as the needle for a local anesthetic. The drawback of such a minimally invasive and simple procedure is that it may or may not yield enough of a tissue specimen for the laboratory to give an answer, and if the sample is too small, a surgical biopsy (under general anesthesia) may be necessary. It is worth knowing that a common aftereffect of fine-needle aspiration of mast cell tumors is external oozing of blood from the site of aspiration for several minutes to 1 hour, which may be messy but is not a cause for alarm unless it persists or worsens.

When visceral mast cell tumors are suspected, radiographs (x-rays) or ultrasound examinations may be used. Routine laboratory tests are necessary to identify a dog or cat’s general health status and suitability to receive medication if needed. Typically, these laboratory tests require a blood sample (for complete blood count, serum biochemistry profile, and in cats, tests for feline leukemia virus [FeLV] and feline immunodeficiency virus [FIV]) and a urine sample for urinalysis. If the decision is made to remove a mast cell tumor, a sample, or biopsy, will be taken of the removed tumor and sent to a laboratory to confirm the diagnosis of mast cell tumor and to determine whether the tumor is more likely to be malignant (reappears or spreads) or benign (removal is curative). This information helps determine if treatment in addition to surgery, or sometimes reoperation, is needed.

The surgical removal of mast cell tumors always involves wide resection, meaning removal of a large region of tissue (skin and surroundings of the tumor) out of proportion with the size of the visible tumor itself. This is because mast cell tumors tend to extend deep “fingers” of tumor tissue into their surroundings, like the roots of a tree extending into soil. These tumor extensions mean that simply removing the visible mass is not enough: the roots left behind are still made up of tumor tissue and can immediately start to grow and spread like the original mast cell tumor.

## LIVING WITH THE DIAGNOSIS

The outlook (prognosis) for pets with mast cell tumor of the skin depends upon the stage of the tumor (see [Diagnosis](#) section). Mast cell tumors that are malignant may spread to multiple areas of the body and cause symptoms such as vomiting that continues to get worse over several weeks’ time. However, patients with mast cell

tumors may be cured just by removal of the mast cell tumor if it is both benign and operable (in other words, can be removed completely without harming vital organs).

Be alert for new skin masses and have them checked by your veterinarian as soon as possible. Some pets can develop multiple mast cell tumors, so a thorough evaluation is necessary.

The prognosis, or outlook for a normal healthy life, for pets with visceral mast cell tumors depends upon the affected organ and whether the affected pet is a dog or cat. Cats with mast cell tumor of the spleen often survive 1 year or more after removal of the spleen. Pets with mast cells in the bloodstream or an intestinal mast cell tumor may have shorter survival times of only several months on average, but as with any illness, there is a great deal of variation from one individual to another and specific predictions of survival depend on several factors, especially an individual's response to treatment.

## TREATMENT

The mainstay of treatment is surgical removal of the tumor. A pet with suspected or confirmed mast cell tumor is pretreated with antihistamines immediately prior to surgery, to prevent the potentially dangerous effects of histamine and heparin release when the tumor is handled in surgery. As mentioned above, the surgeon will try to remove a large amount of tissue around the tumor, in addition to the tumor itself, to reduce chances of missing any microscopic segments of involved tissue. Biopsies of lymph nodes or internal organs may also be taken to screen for tumor spread. The entire spleen is removed in cats with mast cell tumor of the spleen, but the spleen is not essential to life. For skin tumors, radiation treatment may be advised in addition to surgical removal, especially if the mass was in a location where surrounding tissue could not be easily removed. Radiation therapy, and a second opinion if the diagnosis of mast cell tumor is uncertain (or for the latest treatment options), your veterinarian may refer you to a veterinary oncologist. These board-certified veterinary cancer specialists can be found in most large urban centers in North America and Europe (directories: [www.acvim.org](http://www.acvim.org), [www.ecvim-ca.org](http://www.ecvim-ca.org)) and are called Diplomates of the American (or European) College of Veterinary Internal Medicine, Specialty of Oncology.

Cats that have mast cells circulating in their blood or pets whose tumors cannot be controlled by surgery alone may be given prednisone (similar to cortisone) tablets (pills) by mouth as home treatment. A newer and very specific treatment for mast cell tumors in dogs is toceranib (Palladia), a medication that both kills mast cells directly and depletes their blood supply. Some dogs feel nauseated or sluggish when taking this medication, and you should contact your veterinarian if this occurs, to discuss decreasing the dosage or stopping it altogether. Other anticancer medications are sometimes used along with prednisone to prolong the life of pets with a tumor that could not be adequately removed or that had spread to the lymph nodes. Histamine-blocking medications, such as antihistamines, may also be prescribed to control side effects associated with histamine release from mast cell tumors.

## DOs

- Give medicine(s) exactly as directed.
- Check your pet's healing surgical incision daily for redness, swelling, or discharge if surgical biopsy and/or mast cell tumor removal was performed.

- Check your pet's skin for new growths and bring them to veterinary attention should they occur.
- Understand that it will be necessary to perform tests such as a fine-needle aspirate and sometimes a surgical biopsy to determine whether a skin growth is a mast cell tumor.
- Realize that many different types of skin growths occur in dogs and cats and that finding a new skin growth should **not** immediately be interpreted as the presence of cancer. Conversely, mast cell tumors may sometimes be ignored or considered "just fatty tumors" until tests reveal that they are actually potentially serious. Consult your veterinarian and err on the safe side by having fine-needle aspirates done (simple, painless) of skin masses.

## DON'Ts

- Do not handle or press upon any tumor suspected to be a mast cell tumor; damage to the cells could cause histamine and heparin release, which is uncomfortable and can sometimes carry serious consequences.
- After a surgery: do not bathe your pet until the sutures/stitches have been removed, do not let your pet lick or chew the incision, and do not allow your pet to exercise vigorously until sutures are removed.

## WHEN TO CALL YOUR VETERINARIAN

- If there is swelling at or drainage from the surgical incision or if your pet is licking the incision.
- If you notice new skin lumps, have them evaluated immediately. Some pets develop multiple mast cell tumors.

## SIGNS TO WATCH FOR

- Vomiting or sudden weakness may occur due to histamine release from a tumor. If this occurs and a mast cell tumor was diagnosed at any time in your pet's past, notify your veterinarian. Additional medications and/or testing may be worthwhile.

## ROUTINE FOLLOW-UP

- Have surgical sutures (skin stitches) removed in 10 to 14 days if any are on the skin.
- If your pet's biopsy shows an aggressive mast cell tumor, regular follow-up examinations are recommended to check for reoccurrence of the tumor.

Practice Stamp or Name & Address