



Veterinary Specialists of Alaska, P.C. Client Information Sheet: Mast Cell Tumors

Mast Cell Tumors – Information for Animal Owners

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Mast cell tumors (MCT) are the most common skin tumor in the dog. They also occur in the cat. MCT develop from a normal component of body tissues called the mast cell. The normal function of mast cells is the release of inflammatory mediators. In people with hay fever, these cells release certain substances, which play a major role in swelling of the nasal mucosa and development of the typical “allergic reaction”. They also contain substances, which increase the risk of developing stomach ulcers, or which can lead to increased bleeding. If there is a defect in the normal function of a mast cell, it may become a malignant mast cell tumor. Potential adverse effects from the substances released from MCT include stomach ulceration, generalized itchiness and, in unusual instances, massive release of inflammatory mediators with a potentially fatal allergic reaction called anaphylaxis. MCT can spread to the lymph nodes, spleen, or liver, and bone marrow.

Your dog should be examined by a veterinarian if you notice any mass on the skin. A fine needle aspirate or surgical biopsy can be performed, in order to identify the nature of the mass. Most skin tumors in dogs are benign, but early detection and treatment of malignant tumors, especially mast cell tumors, can dramatically affect your pet's long-term prognosis. MCT occur as one of three types: Well-differentiated (grade I), moderately-differentiated (grade II), and poorly-differentiated (grade III). This classification refers to how closely the mast cells of the tumor resemble normal mast cells and ultimately to the biological behavior of the tumor or its tendency to remain localized or spread throughout the body. The prognosis depends on the type of differentiation. For general information on oncology and oncologic surgery, please see our information sheet on that topic.

Predisposed breeds that are affected from mast cell tumors include: Boxers, Boston terriers, bull terriers, bullmastiffs, English setters and golden retrievers. Males and females are affected equally.

The cause of MCT is unknown.

Clinical signs of animals with mast cell tumors of the skin are round, raised masses in the skin. Sometimes manipulation of the MCT leads to severe swelling and inflammation locally. After some time, the irritated area “calms down”. It is important to avoid aggressive manipulation of such masses, as it is believed that with manipulation, cells are being released from the mass and start spreading through the body. In animals with mast cell tumors of the spleen or intestinal tract, lack of appetite, vomiting, abdominal pain, and possibly black tarry stools, due to bleeding in the upper intestinal tract, may be observed.

The diagnosis of mast cell tumors is usually made by fine needle aspiration. A needle is inserted into the mass, and cells are obtained for evaluation under the microscope. MCT show usually specific features, making an exact diagnosis possible in most cases. In addition, a complete blood cell count (hemogram or CBC) is taken to evaluate for anemia, low platelet count, or signs of inflammation. Rarely, circulating mast cells are found in animals with systemic mast cell disease. Furthermore, a serum biochemistry profile and a urinalysis to evaluate your dog's general health and to assess any effects of the mast cell tumor on other body systems are taken. Also, radiographs (x-rays) and abdominal ultrasound are recommended, as these tests can help to detect abnormal areas mostly in spleen and liver. If there are abnormalities, fine needle aspirates under ultrasound guidance should be taken. Finally, mast cells may spread to the bone marrow, and therefore it may be recommended to also perform a needle aspirate of the bone marrow. In some cases, surgical removal of a suspicious skin tumor followed by histopathological evaluation by a veterinary pathologist (excisional biopsy) may be both, diagnostic and curative for small, well-differentiated mast cell tumors of skin, provided a wide surgical excision is performed.



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The treatment for mast cell tumors may include wide surgical excision (removal) of the mass. It is important to understand that these margins should be 2-3cm (1-1.5 inches) around the edges of the tumor. Therefore the incision (scar) is much larger than the tumor. It is better to have a large scar but “clean” margins (no tumor cells are left in the patient), than having to go back to surgery because the margins are “dirty”. With grade I or II MCT, surgical resection with wide margins may be all that is needed. In other cases, radiation therapy for local control of less well-differentiated skin tumors may be recommended, but can unfortunately not be offered at Veterinary Specialists of Alaska, P.C. Radiation therapy may also be recommended to shrink large tumors that initially cannot be treated by surgical excision alone. Surgical excision of such tumors may be feasible after they have shrunken in size in response to radiation therapy. Chemotherapy may be indicated in selected cases, for example if lymph nodes are affected and there is widespread mast cell tumor disease. Some of these drugs may help to decrease tumor size prior to surgical excision. Drugs used in chemotherapy have potentially serious toxic effects and should only be administered by veterinarians experienced in their use. We usually work closely with your regular veterinarian when chemotherapy is indicated for your pet. A new, potentially promising agent is “Palladia”, currently in clinical use only by board-certified dermatologists, such as Dr. Preziosi at VSOA, or board-certified oncologists. A recent study showed a positive effect on long term survival with “Masitinib”, used to treat surgically unresectable MCTs (Hahn et al. AJVR 2010). Additional drugs to counteract the effects of the inflammatory mediators released by mast cell tumors may be prescribed for your pet. These drugs include anti-histamines such as diphenhydramine, and stomach ulcer protecting agents. Cats with mast cell tumors are commonly treated with surgery alone. It may be necessary to repeat surgery if new MCT arise. The prognosis for this treatment in cats seems favorable, compared to dogs. For cats with MCT in the spleen, splenectomy (removal of the spleen) is recommended.

Post operative care consists of limited activity to allow the incision to heal. This is especially important if the tumor was removed from an area of high motion, for example the hock. Medications to prevent infection, provide pain control, and to protect from possibly evident mast cells in the blood circulation may need to be given. Careful monitoring of your pet is important, especially if you have one of the breeds known to be at increased risk. Your dog should be examined by a veterinarian if you notice any mass on his skin as soon as possible. Follow-up examinations are recommended every 2 to 3 months for the first year and then every 6 months thereafter for dogs with mast cell tumor.

The prognosis for MCT is difficult to predict. If not treated, animals die of the disease. A variety of publications provide different survival times, depending on location, lymph node involvement, and grade of tumor. In general, for dogs with grade I mast cell tumors, complete surgical excision carries an excellent prognosis with more than 95 percent of affected dogs alive without disease after 5 years. For dogs with grade II mast cell tumors, there is a wide spectrum of biological behavior, but approximately 80 percent of affected dogs survive for 5 years without tumor recurrence. For dogs with grade III mast cell tumors, the prognosis is poor with surgical excision alone, and less than 50 percent of affected animals survive for 5 years. Survival time can be much smaller if MCT is not treated. It often is impossible to completely excise Grade III tumors. As indicated above, in these cases, radiation therapy may be helpful. Your pet will have to be referred to a specialty clinic or university in the lower 48’s. A combination of surgical excision, chemotherapy, and radiation therapy may prolong the life span of affected animals and improve their quality of life. The one-year survival rate for dogs with unresectable MCTs, treated with “Masitinib” was 61%. For cats that underwent splenectomy, the overall survival time is about two years.

No method of protection against development of mast cell tumors can be recommended because the cause of these tumors is unknown.

We hope that this information pamphlet was helpful to help you. Please do not hesitate to call or ask at your next appointment if you have any questions or concerns.

Your VSOA Team