

## Information for Oncology Clients

### Mast Cell Tumors in Dogs

Comprehensive Cancer Care Service

Ryan Veterinary Hospital of the University of Pennsylvania

Mast cell tumor (MCT) represents a cancer of a type of blood cell normally involved in the body's response to allergens and inflammation. MCT is the most common skin tumor in dogs; it can also affect other areas of the body, including the spleen, liver, gastrointestinal tract, and bone marrow. Certain dogs are predisposed to MCT, including brachycephalic (flat-faced) breeds such as Boston Terriers, Boxers, Pugs, and Bulldogs, as well as retriever breeds, though any breed of dog can develop MCT.

When they occur on the skin, MCT vary widely in appearance. They can be a raised lump or bump on or just under the skin, and may be red, ulcerated, or swollen. In addition, many owners will report a waxing and waning size of the tumor, which can occur spontaneously, or can be produced by agitation of the tumor, causing degranulation. Mast cells contain granules filled with substances which can be released into the bloodstream and potentially cause systemic problems, including stomach ulceration and bleeding, swelling and redness at and around the tumor site, and potentially life-threatening complications, such as a dangerous drop in blood pressure and a systemic inflammatory response leading to shock.

When MCT occur on the skin, they can occur anywhere on the body. The biological behavior of these tumors can vary widely; some may be present for many months without growing much, while others can appear suddenly and grow very quickly. The most common sites of MCT spread (metastasis) are the lymph nodes, spleen, and liver.

#### Diagnosis/Initial Evaluation

The initial evaluation of a dog with MCT typically involves obtaining a needle aspirate or biopsy of the suspicious mass, followed by additional diagnostics to determine the extent of tumor in other areas of the body (needle aspiration of lymph nodes, +/- abdominal ultrasound, +/- bone marrow aspiration if indicated). Bloodwork (complete blood count and chemistry panel) and urine sampling

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are typically performed at the initial visit and provide important information regarding a patient's overall health and the ability of the patient to handle treatment.

### Prognosis and Treatment

The biopsy of a MCT provides important information that determines whether additional therapy, such as another surgery, radiation therapy or chemotherapy, is needed. The most important factors taken into consideration when making decisions about whether or not additional treatment is indicated for a patient with a mast cell tumor include: 1) Grade, 2) completeness of surgical margins, and 3) stage (presence of spread to other parts of the body as described above). Low- to intermediate-grade tumors in general have a low incidence of spread, while high-grade tumors are aggressive and have a higher incidence of metastasis.

Surgical excision is the treatment of choice for mast cell tumors and may be curative in dogs with low- grade completely excised tumors. A second surgery or radiation therapy may be needed in cases where the surgical margins are not clean according to the histopathology report. In dogs where a second surgery is not feasible, radiation therapy (see specific hand-out regarding radiation therapy) is an excellent and highly effective modality which is associated with a high rate of long-term local tumor control.

In low-grade tumors that are completely removed with adequate margins, further therapy is typically not necessary. However, dogs with high grade mast cell tumors or evidence of spread to the local lymph nodes or beyond require systemic chemotherapy in addition to treatment for their local tumor, so-called multi-modality therapy. Several different drugs can be used to treat these high-risk patients, including high doses of steroids, traditional chemotherapy (vinblastine, lomustine), or tyrosine kinase inhibitors (Palladia).

**Additional medications:** Dogs with MCT are often placed on other supportive medications during treatment. These can include prednisone, a steroid that can directly kill cancerous mast cells and decrease inflammation and the effects of degranulation associated with the tumor; antihistamines, such as diphenhydramine (Benadryl); and antacids, such as famotidine (Pepcid) or omeprazole (Prilosec). While it is an effective drug against mast cell disease, prednisone can cause side effects,

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including increased thirst and urination, increased panting, increased appetite, nausea or vomiting, loose stools or diarrhea, or dark tarry stools secondary to gastrointestinal irritation and bleeding. Antacids can be helpful in preventing or lessening some of these side effects.

The prognosis for cutaneous MCT is dependent upon several factors, including tumor grade, tumor stage, and ability to perform a complete surgical excision. Dogs that have had prior MCT are at greater risk for developing additional primary mast cell tumors. Early tumor detection and addressing tumors when they are small and localized increases the likelihood of treatment success and cure. For tumors that have spread distantly (beyond the lymph nodes), or those that occur in locations other than the skin (such as the gastrointestinal tract, spleen or liver), the prognosis is generally poor. The goal of treatment for these patients is to maintain a good quality of life for as long as possible with palliative therapy aimed at controlling symptoms caused by the MCT in the body.

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