

# Canine Cutaneous Mast Cell Tumor



## What are mast cell tumors (MCTs)?

Mast cell tumors are one of the most commonly reported canine skin tumors. Mast cells are a type of immune system cell involved in inflammation and allergy, especially in the skin. MCTs are highly variable in clinical presentation and have a wide variety of appearances. It is also not uncommon for these tumors to wax and wane in size secondary to the release of inflammatory factors (degranulation) such as histamine and heparin, which may lead to inflammation, local bleeding, swelling and gastric upset. We may recommend placing your pet on an anti-histaminic

drug (such as Benadryl) and on an antacid drug (such as Pepcid) until further notice to potentially counter these effects. These drugs are available over the counter at your local drug store.

While any dog may develop a mast cell tumor, there are certain breeds with a predilection to develop mast cell tumors including Brachycephalic breeds such as English Bulldogs, Boxers, and Pugs as well as retrievers.

## Diagnostic tests for patients with MCTs

Despite the range in presentations of this tumor type, mast cell tumors can be readily diagnosed by fine needle aspirate assessment. In some cases, an ultrasound or advanced imaging such CT scan or a biopsy may be recommended to further assess the tumor for surgical planning purposes. Once a diagnosis has been made, the course of treatment will be determined by stage and grade of your pet's tumor.

The stage indicates if the tumor has spread (metastasis) to other areas of the body. Mast cell tumors have the potential to spread to local and distant lymph nodes, and internally to the spleen, liver, and very rarely the lungs. To help stage a mast cell tumor, diagnostics such as (but not limited to) complete blood count, chemistry panel, urinalysis, abdominal ultrasound, local lymph node and liver/spleen aspiration may be recommended.

Grade is determined by biopsy (histopathology) and refers to the appearance of the tumor under the microscope. There are currently two grading schemes and each is reported. One being a three tier system (Grade I, II, III) and the second a two tier system (low vs high grade). The grade of mast cell tumors is highly correlated with their clinical behavior (i.e. likelihood of metastasis).

In the three tier system, Grade I MCTs tend to be less aggressive and remain local, and they do not usually spread to local lymph nodes. Grade III MCTs are aggressive tumors; they can be locally invasive, and they commonly spread to local lymph nodes and distant sites such as the liver and/or spleen. In the two tier system tumors are either low grade (less aggressive, needing only local control) or high grade (aggressive with high probability of spread and requiring local and systemic

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control). In addition to reporting grade, the pathologist can inform us if the mast cell tumor was completely excised or not.

There is some evidence in using cytology to grade MCTs but at this point it is not the standard of care as it is not universally accepted as of yet.

## Treatment options

Treatment and prognosis for this disease are highly dependent upon the grade and stage of the tumor. Surgery remains the mainstay treatment for mast cell tumors. For grade I and most of the grade II (on three tier scheme) or low grade (on the two tier scheme) mast cell tumors, wide surgical excision is generally considered to be a curative treatment.

There is a new product called Stelfonta™ that is an intratumoral injection designed associated with a high degree of local control at 1 year. In order to use the product, tumors need to fit specific criteria for this therapy and cytologic grading is warranted.

Whereas a wide surgical excision is the treatment of choice, under circumstances where a complete excision is not possible, radiation therapy can prevent local regrowth of an incompletely excised mast cell tumor and combination therapy has a 95% chance of local control 1 year and 85%-95% chance of local control at 2-5 years.

In patients with high-risk mast cell tumors (such as grade III/high grade tumors, large tumors, tumors with high division rate, or tumors that have already metastasized), local therapy (surgical excision, +/- radiation therapy) and chemotherapy will likely be recommended. First line chemotherapy protocols for mast cell tumors can include the use of oral steroids (such as prednisone), vinblastine (chemotherapy given intravenously), lomustine (oral chemotherapy, also known as CCNU) or Palladia (toceranib phosphate; oral signal blocker). These drugs may be given as sole therapy or as combined therapies based on your pet's disease.

## Chemotherapy options

The two main chemotherapy agents used against MCTs are Vinblastine (injectable) and Lumostine (oral), given with prednisone. When treating bulky disease, Vinblastine along with Prednisone is associated with a response rate of ~45%. On average, it works for 2-4 months in the gross setting. This drug regimen tends to have very minimal side effects, with occasionally resulting in GI upset. Vinblastine can also lower the white blood cell count but rarely are the patients "clinical" (lethargy, fever etc.)

Lomustine (CCNU) is an oral chemotherapy drug with a similar response rate and duration of response to Vinblastine. The drug is given orally q 3 weeks x 4-6 dosages, depending if treating a bulky tumor or to prevent metastasis (post surgery). CCNU can also cause side effects on the liver and as such your pet will be started on a liver protectant, +/- prophylactic antibiotics. During treatment regular chemistry panels would be monitored prior to ensure that your pet's liver enzymes remain at a normal level.

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The literature suggests that 80% of patients on chemotherapy tolerate their treatment well with no side effects. About 15% experience mild side effects that are self-limiting and can be controlled at home. 5% of patients become sick enough to require hospitalization with supportive care and IV antibiotics commonly the liver and/or spleen (about 70% to up to 90% of the time).

Another agent used against MCTs is Palladia, which is an oral drug administered by the owner at home on a Monday, Wednesday, and Friday basis. The response rate for this is 45%-80% for an average time of 4-6 months in the gross disease setting. There are potential side effects with this drug, most commonly GI, although most are mild and self-limiting, such as decreased appetite, vomiting, diarrhea, weight loss, protein loss through urine, low white blood cell count, high blood pressure, or rarely muscle/ bone pain. If adverse events develop, we simply stop this medication or adjust the dose/frequency. Regular rechecks (CBC/chemistry/Urine analysis) through the oncologist or your local veterinarian to assess your pet's progress would be done to ensure that he/she tolerates this drug okay.

## Palliative options

Steroids, in conjunction with anti-histaminic drugs and antacid drugs can be given to help your pet. Chemotherapy can also be used as a palliative option. It can shrink mast cell tumors and slow down further distant spread.

Palliative radiation can be used alone or in conjunction to chemotherapy/Palladia. Palliative radiation can be very effective in reducing the size of mast cell tumors. This would involve giving one treatment under anesthesia once a week for four treatments. The treatments are given under anesthesia. The response rate, when we combine this treatment modality with Palladia, is about 75%, with half of the patients showing a complete response for many months (median of 11 months). Radiation can cause side effects on the skin, mucous membranes in the mouth (it looks like inflammation). It can also cause hair loss at the radiation site.

*This information has been provided by the Veterinary Cancer Society. Please consult your veterinary oncologist, or your pet's primary care veterinarian, if you have any questions related to the information provided on this document.*