

Canine mast cell tumors (MCTs) are the most commonly diagnosed skin tumor in dogs. Mast cells are a normal part of the immune system and play a role in allergic disorders. They possess granules that contain certain inflammatory substances, such as histamine and heparin.

Mast cell tumors are usually found in middle-aged to older dogs, however, several breeds seem to be at increased risk for MCTs. These include:

- dogs of bulldog descent (Boxer, Boston Terrier, English Bulldog, Pug)
- Labrador Retriever
- Golden Retriever
- Cocker Spaniel
- Schnauzer
- Shar Pei

Mast cell tumors vary widely in shape and size. It is impossible to identify solely on appearance. When underneath the skin, they may appear very similar to a lipoma, which is a benign fatty tumor.

Cytologic evaluation of a mass tumor with a fine needle aspirate is the most common method of diagnosing MCTs. This involves sticking the mass with a needle and removing cells – usually performed while the patient is awake. The cells are then examined under a microscope.

While diagnosis can usually be made with fine needle aspiration, a biopsy is required for histologic grading of the tumor. This requires removal of either the entire tumor or a small portion, which is then submitted to a pathologist.

The grade is determined by multiple factors including the appearance of the cells and the degree of invasion into underlying tissues.

There are three different grades of MCTs:

- **Grade I MCTs;** usually small and have a low metastatic rate. Patients have an excellent prognosis when the tumor is completely removed with surgery.
- **Grade II MCTs;** more invasive and their behavior is more difficult to predict. *Most diagnosed MCTs will be grade II tumors and the majority tumors will behave like grade I tumors and can be cured with surgery alone.*

However, one subset of grade II tumors behave aggressively and can spread to other areas of the body (lymph nodes, spleen, and liver).

Factors evaluated to try to predict aggressive behavior of a grade II tumor include:

- the growth rate of the tumor
- its location
- the mitotic index of the tumor
- other proliferation markers (AgNOR count, Ki67, PCNA)
- whether or not there is a c-kit mutation

Chemotherapy following surgery may be indicated for some patients with grade II tumors when other concerning prognostic factors are present.

- **Grade III MCTs** are aggressive tumors with a high metastatic rate (50-95%). We recommend surgical removal of these tumors along with chemotherapy to try to slow or prevent the spread of the cancer.

For any grade tumor, diagnostic tests to evaluate the extent of cancer is important. This is called “staging.” For canine MCTs, this typically involves aspirating lymph nodes and potentially performing an abdominal ultrasound.

The following defines the staging system for canine mast cell tumors:

- **Stage I:** single tumor confined to dermis without regional lymph node involvement.
- **Stage II:** single tumor confined to the dermis with regional lymph node involvement.
- **Stage III:** multiple dermal tumors or large infiltrating tumors, with or without regional lymph node involvement.
- **Stage IV:** any tumor with distant metastases.

Surgery, chemotherapy, and radiation therapy can all be used to treat canine MCTs. The exact treatment recommendations will depend mainly on whether or not surgery can be performed to remove the tumor with clean margins, the grade of the tumor, and the stage of the cancer.

We are pleased to provide the services of Carrie Hume, VMD, DACVIM, Idaho's only board certified small animal oncologist. Please contact our office if you have any questions regarding oncology care for your pet.