



## CANINE MAST CELL TUMORS

Mast cell tumors (MCT) are very common in dogs, but extremely rare in humans. Mast cells are a special type of blood cell that is normally involved in the body's response to allergens and inflammation. ***MCT can look and feel like anything***, so it is impossible to know if a skin mass is a MCT without looking at cells under the microscope. MCT are generally thought of as malignant tumors that have the ability to regrow after conservative surgery, and some may spread to other organs.

Mast cells contain substances that can be released into the bloodstream and potentially cause other types of effects. These might include stomach ulcers, bleeding, and/or allergic reactions (anything from swelling around the tumor to life threatening shock).

### Preliminary Testing

The skin is the most common site for MCT in the dog. These tumors are locally invasive and can sometimes metastasize (spread) to other areas of the body, although the majority do not. The most common sites of spread are the lymph nodes, bone marrow and liver/spleen.

The initial evaluation of a dog with a MCT often includes: biopsy or fine needle aspirate, complete blood count, serum chemistry profile, urinalysis, lymph node aspirate, and abdominal ultrasound (to look especially at the liver and spleen). In some cases, we may also X-ray the chest.

The pathologist assigns a "grade" to the tumor based on its appearance under the microscope. We use the grade to help predict how the tumor will behave. This influences both the prognosis and recommended treatment. Low or intermediate-grade tumors are unlikely to spread, so complete surgical removal may be the only treatment required. High-grade tumors or tumors with lymph node spread have a higher chance of spreading so we look very carefully for spread and consider using chemotherapy in addition to surgery.

### Treatment Options

Treatment options for cutaneous MCT include surgery, radiation therapy, chemotherapy and symptomatic treatment. Surgery is usually our first and best treatment choice. Because these tumors are invasive, the surgeon must remove the tumor with a large margin of normal appearing tissue both around and underneath it to ensure complete removal. *MCT are deceptive, and sometimes what we can see and feel represents only a small part of the tumor.* Even when a large margin is taken, sometimes tumor cells are still left behind. When this occurs, additional treatment is needed; otherwise, there is a high likelihood that the tumor will regrow. Options include further surgery, radiotherapy, or chemotherapy. It may not always be possible to perform additional surgery because of the location of the tumor.

If additional surgery is not possible, another option is the use of a local form of radiation therapy. This involves the local application of a powerful form of radiation directly onto the tumor area. This treatment is most effective when treating *microscopic* tumor cells left over after surgery, but can be used against larger tumors as well. The current radiation therapy protocol at CSU for MCT typically consists of a total of 15 treatments, delivered Monday through Friday over 3 weeks, although other schedules may be used depending on the tumor location. Using this

protocol after incomplete surgery, approximately 85-95% of dogs will live for 2 years without evidence of tumor regrowth. Cost for treatments, including anesthesia and hospitalization, is usually 4,000-5,000. Please consult the VETERINARY RADIATION THERAPY information sheet for more detailed information.

It is important to remember that surgery and radiation therapy are **local** treatments and have no effect on the potential for spread of the tumor. Tumors with a higher chance of spreading ("high-grade" tumors, tumors arising from the mouth, toenail, perianal region and scrotum, or tumors that have spread to a lymph node) may be treated with chemotherapy in addition to surgery and/or radiotherapy. The most commonly used treatment consists of a pill given at home (*prednisone*) combined with an injectable medication called *vinblastine*. The available evidence strongly suggests that dogs with "high-risk" MCT may have a better outcome with surgery and chemotherapy than with surgery alone. 60% of dogs with "high-risk" MCT will live more than 2 years with a combination of surgery and chemotherapy, compared with only 50% alive after 8 months with surgery alone. Please see the client handout CHEMOTHERAPY IN PETS for more detailed information about this form of treatment.

As mentioned above, we may prescribe additional medications to prevent tumor related side effects. These include an antihistamine (such as Benadryl) and an antacid (Pepcid, Tagamet). We also ask that you watch your pet closely for any problems such as vomiting (especially if there is fresh blood in the vomited material), diarrhea, loss of appetite, or a very dark or black stool (this is a sign of digested blood). If any of these signs occur, we ask that you contact either the Animal Cancer Center or your local veterinarian.

The prognosis for cutaneous MCT depends upon several things, including the microscopic appearance (grade) of the tumor, the location of the tumor, and the presence or absence of spread. Many of these tumors are successfully treated if there is no evidence of spread at the start of treatment. Any future "lumps and bumps" you or your veterinarian detect should be evaluated with a fine needle aspirate, because some dogs that have had one MCT are at greater risk for the development of additional, unrelated MCT. Early diagnosis and removal of these tumors will increase the likelihood of successful treatment.

For those MCT that have already spread, cannot be removed, or that occur in locations other than the skin, the prognosis is more guarded. The goal of treatment for these patients is to attempt to shrink the tumors with chemotherapy, and to maintain a good quality of life for as long as possible by controlling symptoms caused by the presence of mast cells in the body.

## **Follow-Up**

Following the completion of treatment, we recommend that your pet be checked regularly for evidence of regrowth, spread or new tumors. ***Additional therapy is often possible if/when tumor regrowth or spread is detected.*** The tests performed will depend on the expected behavior of the tumor, but could include careful evaluation of the site where the tumor was located, evaluation of the skin for any new lumps or bumps, evaluation of the lymph nodes draining the tumor site, and/or abdominal ultrasound. We typically like to check them one month following the completion of treatment, then quarterly for 18 months, then twice yearly thereafter. Any new lumps or bumps you notice should be brought to our or your veterinarian's attention immediately, rather than waiting for the next scheduled recheck.