Mast Cell Tumors - Patricia Long

September, 1998

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Mast Cell Tumors (MCTs). Many of us have heard the name, but what is a mast cell? The skin is made up of two layers, the thin outer layer, the epidermis, and the thicker tissue called the dermis. This is all attached to the underlying tissues and organs by the subcutis. Within the dermis one finds the hair follicles, nerve endings, sweat glands, and mast cells. The mast cells are what control many of the body's allergic reactions. When the body comes into contact with an allergen, the mast cells release histamine-containing granules. A series of events unfold, ultimately causing swelling.

Sometimes, however, these mast cells begin to grow out of control. As many as 25% of all skin tumors in dogs are mast cell tumors. Half of these tumors are malignant. Most of them appear as raised nodular masses that feel soft to solid. 10 - 15% of them are indistinguishable from fatty cysts which lie under the skin in the subcutis. Half of them are found on the body, 40% are found on the legs, and 10% are found on the head or neck. Although these tumors may be found anywhere, including the liver, spleen, and bone marrow, most of the MCTs are found in the skin. There seem to be breed predilections for MCTs, with Boxers, Boston Terriers, Bulldogs, and Bull Terriers most commonly listed as being at risk. MCTs can occur in a dog of any age, but they are typically found in middle age or older dogs, with a mean age of 8.5 years. They are found in males and females equally; there is no sex predilection. Heredity is thought to play a role. Other risk factors include viral infections, and sites of previous injuries, such as burns.

So you pet your dog every day, carefully checking for any new lumps and bumps, and you find something new - a lump, a bump, or a swelling. Now what? You go to the vet (Note: vets and pathologists can be male or female, I will stick to the standard English usage, sorry ladies!) and ask him to do a fine needle aspirate of the suspicious area. He sucks some of the cells into a syringe. He might test some of the cells between his fingers, cells from a fatty cyst (lipoma) feel distinctly greasy. But if that greasy feel is missing, a slide will be prepared for review by a lab. If the report comes back MCT, the next step has to be planned. Surgery, chemotherapy, radiation, or combinations of these are all options. Radiation would be used if the tumor is inoperable, the whole tumor wasn't or couldn't be removed, or after surgery to prevent a recurrence of the tumor. Chemotherapy in this case is not what you think, it is prednisone. (Note: chemotherapy in dogs is not typically as devastating to their system as it is for humans. They get lower, more frequent doses, and the side effects are usually minimal.) The steroids - prednisone or prednisolone - are the most effective for fighting mast cell. It is
used for treating the cancer if it has metastasized (spread to other locations in the body), to help shrink a MCT prior to surgery, or to help prevent metastasis after surgery.

Surgery is the preferred treatment choice. The tumor normally consists of a seemingly well-defined core, but there is a "halo" of cells in the normal-looking tissue around that core. So a surgeon needs to remove the lump along with 3 - 5 cm. of surrounding tissue. The lump is then sent to a pathologist for analysis. Grading a tumor is done to help a Veterinarian determine the best treatment options. The tumor is examined to determine how well differentiated the cells are. As you may remember from beginning biology, the standard cell structure has, among other things, a cell wall and a nucleus, a bit like a long box with a ball in it. This is a well-differentiated structure. But as cancer cells grow out of control, this structure breaks down, and often becomes an amorphous mass with lots of nuclei and very few distinct cell walls. This is called an anaplastic tumor (ana - backward, plasia - growth), and is not differentiated enough to even determine the type of cancer cells present. The anaplastic tumors are very aggressive, fast growing cancers. Grade I tumors are well-differentiated, and are not very aggressive. Grade II can be difficult to rate. If they are well-differentiated and localized similar to Grade I, they can usually be treated with a moderate approach. If the cell is well-contained but with poorly differentiated cell structure, or if MCTs are found at multiple sites, it should be treated very aggressively. Some vets call this Grade II aggressive. Grade III tumors are very aggressive and poorly differentiated. (Note, some labs use just the opposite grading method, so listen carefully before panicking!) In addition, samples of the biopsy will be checked to see if any cancer cells are found at the edge of the sample. If none are found, the margins are said to be 'clean.' If cancer cells are found anywhere at the edges, then the margins are dirty. But remember, the pathologist is not able to look at all cells at the edge, so a report of clean margins is not a guarantee that the entire cancer was removed.

For the next step in planning treatment, it helps to use a tool developed by the World Health Organization called the Clinical Staging System.

Stage I - solitary tumor confined to the dermis without lymph node involvement
Stage II - solitary tumor with regional lymph node involvement
Stage III - multiple dermal tumors with or without lymph node involvement
Stage IV - any tumor with distant metastasis or recurrence with metastasis

A typical chemotherapy regimen will start with prednisone, and if no response is seen after two weeks, the drugs used will be cyclophosphamide, vinblastine, and prednisone (CVP). Tagamet will generally be used to minimize stomach irritation from the prednisone, as well as to counteract the histamines released by existing mast cells. (Note: the histamines may cause the surgical incision site to heal more slowly than normal.) Typical treatment options for the different stages are:

1 - surgical tumor removal
Clean margins - no further treatment
Dirty margins - wider surgical excision or radiation
II - surgical excision
Clean margins - pred for at least 6 months
Dirty margins - wider surgical excision and pred, or radiation & pred
III & IV - local therapy (surgery) if possible, pred or CVP

So remember, ALWAYS check for lumps and bumps, and ALWAYS get them checked by your vet! Insist on it, and don't feel like an old fussbudget!

From the List:

**Margie Reho** battled MCTs with Elga for several years. The first MCT was found on a rear leg just above the hock when Elga was almost 7. Advised by one vet to amputate the leg, Margie chose instead to have only the tumor removed. Additionally, a small (originally thought to be) lipoma was found and removed very topically from the chest. During surgery on the leg, and post-surgical pathology indicated that full removal for clean edges was not possible due to the tumor's location. Pred was injected into the leg site for several weeks, and Elga was put on a program of oral pred and Tagamet daily. Several weeks later, the tumor on the chest returned. This time, it was removed cleanly with plenty of the underlying muscle, and pred was again injected into both sites for several weeks. At six months post surgery, with no sign of regrowth on either MCT, and Elga happy and healthy, the decision was made to alter her drug treatment. The cancer drug Vincristine was added to the program because existing statistics stated that oral pred plus Tagamet appeared to have diminishing effect on Type II aggressive MCTs beyond 6-9 months. Vincristine was administered IV by the vet on a 4-6 week basis for the next 3 years. [The pred and Tagamet continued as well.] 1 year 9 months later, Elga was looking great, when another growth was found on her right elbow. Margie was relieved when it was found to be a spindle cell tumor, very aggressive locally, but easily removed and treated. Additional cancer types are common with a suppressed immune system (suppression caused by chemo). Steroids were used to shrink it before surgery, and the roller coaster went up again. Elga stayed healthy, active, in perfect weight and condition and totally "normal", even on her almost 3 and 1/2 years of chemo. She lived to over 10. At that time, the spindle cell tumor reoccurred at the same site, but just before surgery, it was determined that cancer had invaded her spleen and the spleen was in a state of partial rupture. Prior to this, neither known MCT, nor any new ones had appeared.

**Melissa Bartlett's** 9 year old Panda had a MCT removed from her elbow. It returned a year later, and was removed again. Panda lived problem free until just before her 12th birthday when her legs failed her. Melissa told us that surgery in Berners after age 10 is hard on the dog, with a slower recovery time, and the dog seems to feel pretty bad.

**Kathie Meier's** 7 year old Kari had a MCT on the inner upper eyelid. The lump itself looked innocuous. Kathie only found it because there was a swelling above the eye. She opted for radiation for Kari, 3 weeks of treatments 5 times a week. Kari was intubated
daily (for anesthesia) during the treatment, and other than some hair loss and specialized home-care during that time, Kari went through the treatment with little difficulty. Four years later, Kari was still doing quite well with no mast cell recurrence, although the hair never did grow back over that eyelid!

**Moyra Bunger's** Bess had a lump appear overnight on her left knee. It was the size of a golf ball. She had two surgeries, and a treatment of prednisone. She got a clean bill of health at the last check-up, but Moyra is very diligent in looking for new lumps, a process that Bess loves!

**Sue Van Ocker's** 4 year old Jessie had a small MCT removed from her lower eyelid. After consulting with Dr. Jeglum in West Chester, PA the decision was made not to use any pred, and observation was the only treatment used. Jessie appreciated the medically prescribed belly rubs! Since 1996 Jessie has had two additional "bumps" - fortunately they have been fatty tumors, not MCTs!!

**Terri Zimmerman's** 6.5 year old Zephyr had a lump on his front leg that was removed within two weeks of finding it. It was a tumor, and turned out to be a grade one well-differentiated mast cell tumor. Blood work was done to find out if there was any systemic spread of the disease. The blood work came back clear, and the vet decided that observation was all that would be necessary by way of treatment.

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**Binay Curtis'** Bandit was 5 years old with a lump behind her ear. It had been checked before, but started to be a concern since it seemed to change size. Diagnosed as mast cell, it was immediately removed. Bandit came home crying in pain with a stomach getting bigger. Fearful of bloat, she went back to the vet's office for monitoring through the night. No bloat, but I never learned why this happened, perhaps drinking too much water, or maybe a response to the anesthetic.

In an attempt to learn to avoid more MCTs, I visited the oncologist. The reading material wasn't much more than the information in this article. She basically had a "That's a Bernese Mt. Dog for you" attitude.

Four months later, I found another MCT on the side of her body. It was removed, it was Grade I, but we had the vet use a different anesthetic, and had Bandit monitored by the vet overnight.

Three months later, two more tiny bumps, one on her side and two on her chest. We shaved her down and searched everywhere, found 8 lumps in all. I marked them with liquid paper for the vet, all were removed. Most were MCTs, Grade I, some were unclear, and some were fatty tissue. Bandit recovered well!

Desperate to stop the onslaught, we considered doing chemotherapy. But because of the stomach problems that Bandit has, and because the tumors were all Grade I, we opted against this. We also visited a holistic vet, tried some herbal therapies, but stomach problems prevented any of their use for very long. MGN3 was the only one she could tolerate. The holistic vet seemed to feel that the stomach problems may have something to do with the MCTs. The mainstream vet insists that the cancer is not systemic, the tumors are all Grade I, nothing in the bloodwork to indicate a problem. She
also indicated that MCTs can come and go, so Bandit's may have always been present and we simply finally found them all. Bandit has been on venison and potatoes for 2 months since the surgery, she is doing well, her energy levels are up, and we haven't found another lump!

Bandit has had a few mast cells removed - all grade 1 in the past year since surgery. Since they've all been grade 1, our vet tries to remove them with a "punch hole" biopsy. This way, she can send it to the lab and can determine if the punch hole was enough (because of margins), and, if not, more surgery. If so, we're done. This works a lot better than repeated surgery.

**Pat Long's** Maggie had a lump suddenly appear in her front leg, and in two days it had more than doubled in size. She had to convince the vet to aspirate the lump, which felt just exactly like a fatty cyst. He sent a slide to the lab, and it came back mast cell tumor. The lump was removed immediately, and the pathology result was grade I, fully contained. No further course of action was needed, other than constant monitoring for any new lumps or bumps.

**References:**


Other web sites: [http://www.oncolink.com/](http://www.oncolink.com/) (search for mast cell)
[http://www.vetmed.ufl.edu/sacs/Oncology/treatmentprotocols.htm](http://www.vetmed.ufl.edu/sacs/Oncology/treatmentprotocols.htm)