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## **MAST CELLS**

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### **What are mast cells?**

Mast cells are important immune system cells that help in inflammatory responses of the body. They are activated to fight off parasites and aid in allergic responses, and they do so by releasing inflammatory biochemicals such as histamine.

### **Mast cells in dogs**

In dogs, the mast cell tumor is the most commonly diagnosed skin mass, accounting up to 25% of the cases seen by veterinarians. It can develop in any breed, age, and sex. Certain breeds are predisposed to mast cells, such as Boxers, Bulldogs, Boston Terriers and Pit Bulls. The tumor can appear as a single lump or multiple lumps, have hair or no hair, and can appear large or small. You may see marked swelling, redness, bruising, and even bleeding around the affected skin. Because these cells release inflammatory biochemicals, the masses can shrink and grow within days and can even cause for your pet to develop symptoms of vomiting and lethargy.

### **How do we diagnose it?**

The best way to diagnose a mast cell tumor is by performing an aspirate of the growth. Distinct dark purple granules in large round cells are observed under the microscope.

Other diagnostic tests that your veterinarian may want to conduct include x-rays, an ultrasound, and bloodwork. This will help determine whether or not there has been a spread to other organs and also to further move forward with the ideal treatment options and planning therapeutic strategies.

### **How is it treated?**

Dogs with mast cell tumors can be treated with surgery, radiotherapy, chemotherapy or a combination of all. If a single mass is present and no signs of spread are visible, surgery can prove itself curative. These masses can have growths beyond what is visible and require a large incision to be made around the growth to make sure that all malignant cells are removed. Sometimes, these masses grow in areas difficult to perform surgery and in that case, radiotherapy would be the treatment of choice. If there are signs that the tumor has managed to spread, chemotherapy would be the therapy of choice.

### **What is the prognosis?**

Mast cells can be difficult, therefore, to determine prognosis and treatment there are various ways to stage and classify them. Once the mass is aspirated/removed and determined whether there is involvement elsewhere in the body, a therapeutic plan can be implemented. They are staged I to IV. Stage I is one noted growth confined to the skin with no lymph node involvement, in stage II there is lymph node involvement, in III there are many masses with marked infiltration into the skin and in IV there is spread to other organs of the body. Furthermore, there are two ways pathologist grade these cells, the Patnaik system and the Kiupel system.

In the Patnaik system, masses are classified from grade 1 to 3. Grade 1 is the most benign in the sense that there is only one large, locally invasive growth with no signs of spread to other parts of the body and low rate of malignant cells. In grade 3, there cells are invasive and aggressive. Grade 2 is a bit of a gray area, where there is a degree of malignancy but can be confined to the location of the mass, this is where the Kiupel system comes into the picture.

The Kiupel system distinguishes the mass in two basic sections – high grade and low grade. The various ways to stage and classify mast cells allow us to understand monitoring and prognosis for your pet. For example, a stage I Patnaik grade 1 has a favorable prognosis – since it is localized and there is low grade of malignancy. A stage IV grade 3 on the other hand lets us know that there is involvement beyond the mass and that prognosis is guarded to poor.

### **What about cats?**

Mast cell tumors can also arise in cats, but they tend to follow a simpler way of classification, there is a cutaneous (skin) or visceral (internal organ) form. The predilected sites where we may see the skin form arise in the head region and the legs. Once an aspirate is done and confirmed a mast cell and the growth removed, we can further classify the growth as either differentiated or pleomorphic (variation in size and shape).

The differentiated type usually shows local growth with very low grade of malignancy whereas the pleomorphic type can show properties of malignancy. There is an atypical cutaneous mast cell tumor in cats, they are called atypical because they appear in very young cats,

sometimes these growths manage to disappear on their own.

The visceral form likes to target abdominal organs such as the intestines, liver and spleen. Since it is inside the body, things that we look out for include vomiting and weight loss, all in correlation with the release of histamines and inflammatory components from these cells. If there is spleen involvement, surgical intervention and spleen removal can be therapeutic. If there is involvement in other organs, prognosis is less favorable and at that point chemotherapy would be the treatment of choice.

### **What is the prognosis?**

There is good prognosis for the cutaneous form – surgical removal is curative. Whereas the visceral form has a guarded to poor prognosis and is based on whether your cat is eating or not and whether if there is a single organ that is affected or if there is involvement of two or more.

