

# Brain tumors in cats

Your cat has been diagnosed with a possible brain tumor. Many people have family members or friends that have been diagnosed with cancer. While it's always scary to get a diagnosis of cancer in your pet, it is very important to remember that many pets can be treated effectively and still have a good quality of life for a significant amount of time.

## Clinical signs

The clinical signs that you might notice in your cat depend on the location within the brain. Below is a list of common clinical signs that are seen based on tumor location. Not all of the neurological signs need be present. Often there are non-specific changes that are noticed by owners, such as lethargy, decreased appetite, and weight loss.

### *Location & clinical signs*

**Forebrain:** Seizures, behavior change, change in personality, weakness on the opposite side of the body, blindness, eliminating in the house, endocrine disease (e.g., diabetes, Cushing's disease)

**Brainstem:** Balance problems (head tilt, falling, rolling), facial weakness, difficulty swallowing, weakness on one side of the body or weakness in all four legs, change in level of consciousness

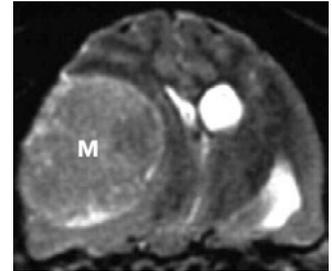
**Cerebellum:** Spastic or goose-stepping gait, head tremors, incoordination

## Diagnosis

In most cases, a presumptive diagnosis is made using a combination of tests, the most important of which is some form of brain imaging. Blood tests are performed in all patients before anesthesia to rule out systemic disease as a cause of your cat's clinical signs and to be sure that your cat will be able to tolerate anesthesia. Blood tests RARELY provide a diagnosis of cancer. We also commonly perform chest X-rays and abdominal ultrasound to rule out other diseases, such as heart disease, pneumonia, and cancer in the abdomen.

MRI is the best imaging tool available to visual-

ize the brain. Computed tomography (CT) scan (commonly referred to as a CAT scan) is another way to visualize the brain more cost-effectively. However, the image quality of soft tissues, such as the brain, is far superior with MRI and gives us much more information. CT scans will occasionally miss smaller abnormalities that MRI can detect. X-rays of the skull RARELY show abnormalities.



Transverse MRI obtained from a cat that was circling to the right showing a large meningioma (M), a tumor of the membranes surrounding the brain. The cat made a full recovery after surgery.

A spinal tap may be performed to help further narrow the possible causes for your cat's clinical signs. A small sample of the fluid that surrounds the brain and spinal cord is collected while the patient is under general anesthesia. This procedure is not painful to your pet. Spinal fluid analysis is used to help rule out inflammation & infection in the brain and occasionally will provide a definitive diagnosis of lymphoma, a type of cancer.

MRI and spinal fluid analysis usually will allow us to diagnose a brain tumor fairly confidently. However, the only way to make a 100% definitive diagnosis is to biopsy the tumor.

## Treatment

Treatment options depend upon the likely type and location of the tumor and include surgery, radiation therapy, chemotherapy, and oral medications.

### *Surgery*

If the tumor is in a relatively superficial location, surgery is the best form of treatment to either completely remove the tumor or to remove as much as possible (debulk). Meningioma is the most common brain tumor in cats. This is a cancer of the meninges, which are protective membranes that

surround the brain and spinal cord. Surgical removal of meningiomas may provide a long survival time with a good quality of life and may even be curative. If the tumor is not surgically accessible, radiation therapy or oral chemotherapy become the best treatment options. In some cases, radiation therapy is recommended following surgery.

### *Radiation & chemotherapy*

Radiation therapy and chemotherapy are MUCH better tolerated in animals than in people. Radiation works by damaging the DNA in the cells that it hits. When the cancer cells try to divide, they die because the DNA has been damaged to the point that the cell can't divide. Cancers that are dividing quickly will shrink faster than cancers that are dividing slowly. Many brain tumors divide relatively slowly, so it might take 3-4 months to see the full effect of radiation therapy. In the meantime, many patients are given oral medications to help control the clinical signs. Most patients tolerate radiation and the anesthesia quite well as long as there are no significant concurrent diseases, such as heart disease, diabetes, Cushing's Disease, and kidney failure.

Chemotherapy works similarly to radiation in that it damages cancer's ability to divide & grow. Only a few chemotherapy medications can enter the brain due to the presence of a blood-brain barrier that prevents anything toxic from entering the brain. The most commonly used medications are Lomustine, an oral medication given every 4-6 weeks, and cytarabine, an injection given underneath the skin or intravenously every 3-4 weeks.

Many people have negative thoughts about radiation and chemotherapy because of the side effects seen in people. Both radiation therapy and chemotherapy can damage normal cells in the body which can lead to the typical side effects of nausea, vomiting, diarrhea, bone marrow suppression, and hair loss. A major difference in animals is that these side effects, while possible, are much less frequent than in people. This is because physician oncologists give the highest dose possible to keep people alive for more than five years. Animals have a much shorter lifespan than people, so our goals are slightly different. We can't tell your pet, "You're going to be sick from this treatment, and you have to live with it." As a result, we give slightly lower doses of chemotherapy to dogs and cats to avoid the severe side effects while giving your pet as good a quality of life for as long as possible.

### *Medical management*

Prednisone is the medication used most commonly. It helps reduce cerebral edema, which is fluid accumulation within the brain tissue surrounding the tumor. Prednisone can lead to a dramatic improvement in your pet's quality of life. Other medications, such as anti-seizure medications, also may be given depending upon the nature of your cat's illness.

### **Prognosis**

As in people, treatment rarely cures cancer. Thus, our goal is to provide the longest survival time possible while maintaining a good quality of life for you and your cat. Historically, many people euthanized their pets as soon as a diagnosis was made or they would not allow surgical biopsy or autopsy to obtain a definitive diagnosis. As a result, we do not have survival data from large-scale studies as they do in human medicine.

The prognosis for many brain tumors in cats is uncertain except for meningioma. If the meningioma is accessible, surgery carries a good to excellent prognosis with an average survival time of about two years. If the entire tumor can be removed, surgery may be curative. The prognosis for other tumor types (e.g., glioma, lymphoma, pituitary tumor) depends upon the treatment method chosen.

In general, surgery and radiation therapy potentially can provide a good quality of life for 1-2 years. There is very little data on chemotherapy in cats to provide an accurate prognosis. Patients that are treated with steroids alone often are euthanized within 3-6 months due to the progression of clinical signs. While these numbers do not sound like a long time to us, it is important to remember that cats have a much shorter lifespan than people and 1-2 years is a long time for them. Regardless of what treatment method you choose for your pet, we will do everything we can to improve your cat's quality of life. ■