

Brain Tumors

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BASIC INFORMATION

Description

Brain tumors (sometimes called *neoplasms*) may affect both dogs and cats. They may be benign or malignant. These tumors may arise from brain tissue (called *primary tumors*), grow into the brain from nearby areas of the head (such as the skull), or spread to the brain from another site in the body (metastatic tumors). The latter two types are called *secondary tumors*.

Brain tumors occur more frequently in older dogs and cats; however, on rare occasions, young animals can be affected. Commonly affected breeds include the golden retriever, Labrador retriever, collie, Boston terrier, and boxer. The domestic shorthair is the cat most commonly affected.

Causes

The cause of most brain tumors is unknown, but several types of tumors exist:

- The most common brain tumor in dogs and cats is the meningioma, which develops from the tissue that covers the brain and spinal cord (the meninges).
- The most common tumors that develop from tissue within the brain are gliomas, which can be classified as astrocytomas or oligodendrogliomas.
- Sometimes, tumors form from cells lining the ventricles (cavities within the brain that are filled with cerebrospinal fluid). Examples of these tumors include choroid plexus tumors and ependymomas.

Secondary tumors that arise in the nose, sinuses, skull, ears, or eyes may invade the brain. Cancer in other areas of the body can spread (metastasize) to the brain.

Clinical Signs

Signs vary with the location and size of the tumor. Neurologic signs may develop gradually over weeks to months or arise suddenly. Common clinical signs include seizures, behavioral changes, loss of vision, and abnormalities in gait. As tumors enlarge the flow of cerebrospinal fluid (CSF) can become obstructed, causing signs of secondary hydrocephalus. (See also the handout on **Hydrocephalus**.)

Diagnostic Tests

A neurologic examination, laboratory tests, and x-rays are often recommended to rule out other diseases that produce similar signs and to search for tumors elsewhere in the body. Imaging of the brain via computed tomography (CT scan) or magnetic resonance imaging (MRI) usually reveals a mass in the brain suggestive of a tumor but may not provide a specific diagnosis. A brain biopsy

may be required to confirm the diagnosis. Biopsy samples are sometimes obtained during surgery or by guiding a needle into the tumor during the CT scan.

A spinal tap and collection of CSF for analysis may be recommended to eliminate other brain diseases, such as inflammation, but this can be risky in some patients with elevated CSF pressure in the brain.

TREATMENT AND FOLLOW-UP

Treatment Options

Treatment options vary depending on the type and location of the tumor and the clinical signs produced. Surgery, radiation therapy, medical management, or a combination of these may be pursued.

Medications that may be administered include anticonvulsant drugs to control seizures and steroids to decrease inflammation and edema associated with the tumor. Although these medications do not affect the growth of the tumor, they can improve clinical signs and the animal's quality of life. Chemotherapy may be beneficial for certain brain tumors but has not been as successful as surgery or radiation therapy.

Surgery can be performed on tumors in certain regions of the brain. Because they arise from the tissue covering the brain, meningiomas are often amenable to surgery. Surgery may allow removal of most of the tumor and relieve clinical signs. Although most animals recover well from brain surgery, serious risks exist, including worsening of clinical signs and death.

Radiation therapy can be used for tumors that are inoperable or to destroy tumor cells left behind from surgery.

Follow-up Care

Frequent recheck visits are needed when therapy is initially started, to monitor for complications after surgery and to adjust medication dosages. Radiation therapy typically requires several weeks of treatment, followed by recheck visits about every 2 months. Continuous, long-term follow-up is needed for most patients with brain tumors.

Prognosis

Long-term prognosis for animals with a brain tumor is always very poor. Prognosis is affected by tumor type and location. Some cats with meningiomas may live 2-3 years after surgery, and dogs with meningiomas may survive for months or longer. It is not always possible to surgically remove the entire tumor in most dogs. Consequently, radiation therapy may be used after surgery to extend the survival time of affected animals. Without treatment, clinical signs in most animals worsen over several weeks. Most secondary tumors are cancerous, are very difficult to treat, and carry the worst prognosis.