Veterinary Health Center
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# Brain Tumors

Brain tumors are a common condition in dogs older than 9 and cats older than 12. Meningiomas and gliomas are the most common brain tumors in dogs. Head conformation in dogs is a risk factor for some specific tumor types. Meningioma is more common in the long-nosed breeds (e.g. golden retriever), whereas glioma is common in the short-nosed breeds (e.g. boxer, Boston terrier). Meningioma is the most common brain tumor type in cats.

**Clinical Signs**

Clinical signs reflect the location of the tumor in the brain. Common neurologic signs observed in animals with brain tumors include altered mentation (e.g. mental blunting, stupor, coma), behavior changes, seizures, loss of coordination and circling. Seizures are the most common clinical sign in dogs. Brain tumor should be considered as a disease differential when a dog has its first seizure after 4 years of age. Clinical signs in cats often are vague or nonspecific with anorexia and lethargy being most common.

**Diagnosis**

A minimum database that includes complete blood count, biochemical analysis, and urinalysis is useful to exclude other underlying systemic diseases that also can mimic signs of brain tumors. Thoracic and abdominal radiography and abdominal ultrasound are useful screening tools to rule out metastatic disease and coexisting medical conditions that may alter treatment plans. These diagnostic testing procedures also ensure the animal is healthy for anesthesia. Magnetic resonance imaging (MRI) is the preferred imaging technique for diagnosis of brain tumors. MRI provides detailed imaging with respect to the size, margination, tissue properties and anatomic location of the

tumor, as well as identification of secondary pathologic effects (e.g., edema, mass effect, obstructive hydrocephalus) caused by the tumor.

**Treatment**

Goals for treatment of brain tumors are complete tumor removal or size reduction and control of secondary effects (e.g., edema, increased intracranial pressure). Treatment options depend on tumor type and location, onset of clinical signs, costs, and associated morbidity/mortality. Treatment guidelines for specific types of brain tumors consist of palliative and definitive therapies.

For animals with brain tumors, palliative therapy has been focused on controlling brain edema and seizures. Corticosteroid treatment counters the secondary effects of peritumoral edema and obstructive hydrocephalus and reduces intracranial pressure that can lead to brain herniation. Anticonvulsant therapy for acute (e.g., diazepam) and maintenance (e.g., phenobarbital) seizure control is indicated for tumor-associated seizures.

Surgical resection and radiation therapy are the common definitive methods used to treat canine and feline brain tumors. Surgical treatment alone can be curative for selective tumor types when complete resection is achieved, but is often limited by anatomy and extent of disease. Other advantages include size reduction of the tumor, a definitive diagnosis and prognostic information for adjunctive treatment planning such as radiation therapy. Surgical treatment is most common for meningiomas in dogs and cats. Radiation therapy is beneficial in the treatment of brain tumors as a sole therapy or as an adjuvant to surgical resection. The recognition of canine brain tumors as a translational disease model has created collaborative opportunities for novel methods of therapy delivery and in targeted therapies. Such treatment studies are ongoing at some veterinary referral centers.

**Prognosis**

Except for feline and canine meningiomas, the prognosis for other brain tumor types is quite variable. The prognosis with palliative-treated brain tumors is poor over the long term. Dogs with brain tumors definitively diagnosed at necropsy had a median survival of two months after diagnosis with brain imaging. In dogs with meningiomas that were surgically excised, the reported median survival is approximately seven months. Median survival times for dogs with brain meningiomas treated by combination surgical excision and radiation therapy have been reported to be between 11 and 28 months. Radiation as the only therapy has produced median survival times of 11.5 to 19 months in dogs with histologic diagnosis of meningioma. Since cats have meningiomas that can be completely removed by surgery, their overall survival prognosis is better than dogs with survival times beyond three years.