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## Feline Meningioma: Clinical signs and treatment options

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- Most common brain tumor in cats, typically 10 years or older
- Symptoms: altered mentation, circling and difficulty walking, blindness, and seizures
- MRI is needed to confirm the diagnosis and location of the tumor
- Surgery is the treatment of choice for accessible tumors
  - In more than 90 % of cats who undergo surgery, clinical signs resolve, and they tolerate surgery and anesthesia well – only ~10% have regrowth of their tumor in their lifetime
- Radiation therapy can eliminate/minimize symptoms for up to approximately 2 years

Meningioma is the most common brain tumor in cats<sup>1</sup>. They are slowly growing tumors – the vast majority are considered “benign” but cause clinical problems because they grow within the skull and compress the brain. Malignant (cancerous) meningiomas in the cat are rarely seen<sup>2</sup>. Most feline meningiomas grow in the front part of the brain (forebrain). Cats tend to be older at the time of their diagnosis (12-13 years). The clinical signs of the tumor are variable and depend on where the tumor is growing; behavioral changes are common – altered mentation, circling, lack of muscle coordination, blindness, pacing and loss of balance are common clinical signs. Seizures may be the only clinical sign<sup>3</sup>.

A diagnosis is made based on advanced imaging with an MRI, then treatment options are discussed. In general, treatment includes medical management, radiation therapy and surgery. Chemotherapeutic options (drugs used to kill the tumor cells) are limited for brain tumors –their effectiveness in the brain is poor because the blood vessels in the brain serve as a barrier to the entry of those drugs. The mainstay of medical management is oral steroids, which are used to reduce swelling (edema) that surrounds the tumor. This is a comfort care treatment option that often improves clinical signs in the short term but does not change the size or growth of the tumor itself.

Radiation therapy (RT) can be used in the treatment of brain tumors, including meningioma, that are not surgically accessible. A recent study evaluated the response to RT in cats that had brain tumors - the average overall survival time was 515 days for all tumor types combined<sup>4</sup>. Longer survival times were seen in cats with meningioma compared to cats with other types of tumors (eg, glioma).

For cats with surgically accessible meningioma, surgical removal has been shown to offer the longest survivals, and in many cases is essentially curative. A recent study examined survival times in cats who

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underwent surgery for meningioma. One hundred and twenty-one cats were included in this study<sup>5</sup>. The study showed low mortality of only 6% (cats who died during or immediately after surgery). During the course of the study, 6 cats were eventually euthanized due to confirmed regrowth of the tumor, with an additional 3 suspected to have re-growth based on a recurrence of clinical signs. Thus, only 16 out of 121 cats died as a direct consequence of the surgery or tumor regrowth. Cats that lived for more than 1 month after surgery had an average survival of over 3 years (38 months), with some surviving more than 4.5 years. Importantly, most of these long-term survivors (45/54) did not die from tumor regrowth; many cats in fact went on to die of age-related causes that were unrelated to the tumor. Additionally, although the average age of the cats in this study was 12 years, the survival times still exceeded 3 years, thus age does not prohibit recommendation of surgery for treatment of meningiomas in cats.

For cats with clinical signs that are compatible with a potential meningioma, or for cats with a confirmed meningioma, consultation with a neurologist should be strongly considered. If surgery is possible, then the clinical outcomes are usually quite good. In the majority of cases, surgical complications are low, the survival times are long, and the quality of life after surgery is high. And while surgical removal may represent the most definitive treatment for feline meningioma, if surgery is not possible, it should be remembered that with appropriate medical management, we can often achieve temporary resolution of clinical signs that allows the cat and the owner to have good quality time together. This can be very comforting to a family suddenly faced with a pet with neurological disease.

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