



How to approach the cat with brain disease (specifics of the neurological examination, common differential diagnoses, diagnostic procedures and case examples)

Niklas Bergknut, DVM, PhD, Dipl. ECVN

Evidensia
The Netherlands
Niklas.Bergknut@evidensia.nl

Cats with neurological problems often present with more subtle complaints compared to dogs. In addition, the neurologic examination can be very difficult to perform in uncooperative cats.

As the window of opportunity, to perform a neurologic examination in cats, often is short. It is important to first obtain a detailed anamnesis and to be succinct when performing the exam.

Neurologic examination:

- Observe the cat walking freely of the floor paying special attention to:
 - o Mental state and behavior
 - o Gait and posture
- Cranial nerve reflexes and cortical responses.
- Postural reactions (Hopping is usually easier to evaluate than paw placement in cats).
- Spinal reflexes (This is one of the least important aspects in cats with signs of suspected fore brain disease).
- Sensory evaluation - pain perception (Cats with large intracranial processes are often painful on manipulation of the head and neck).

Signs of cerebral (fore brain) disease in cats can range from very subtle, with slightly reduced mental state or mildly altered behavior, to the more severe with severely altered behavior and generalized seizures. The classical signs of a focal, lateralized forebrain lesion is circling to the side of the lesion and having contralateral proprioceptive deficits (hemiparesis) despite having a near normal gait pattern.

Signs of more caudally located brain lesions (from the midbrain to the medulla oblongata) tends to manifest with a more obvious reduction of the mental state (stupor to coma). These patients generally also have clear proprioceptive deficits with a tangible gait disturbance. There are usually also cranial nerve deficits, corresponding to the site of the lesion.

Common causes of intracranial disease in cats:

- Vascular (Ischemic infarcts are reasonably common in cats, much more so than hemorrhagic infarcts).
- Infectious/inflammatory disease.
 - o FIP is by far the most common infection seen in cats and the presentation can be quite varied.
 - o Bacterial meningoencephalitis is also common in cats and is generally caused either by penetrating bite wounds or an untreated otitis media/interna which then extends inwards.
 - o FeLV and FIV can both cause CNS infections and is not uncommonly seen.
 - o Toxoplasmosis is a common cause of CNS infection in cats. It is however a challenging diagnosis to establish as many cats will have been exposed to the parasite and have developed antibodies without having suffered clinical signs of disease. When testing for toxoplasma it is important to test for both IgM and IgG antibodies, where an increased IgM indicates a more acute infection.
 - o Born disease virus (staggering disease) is common in parts of Europe but rare in the Netherlands. The common presenting signs of this (believed to be) tick-borne disease are pelvic limb ataxia, pyrexia, behavioral changes and an uncanny inability to retract the claws. This is mostly a progressive disease with usually a poor outcome, although a few cats have been reported of having recovered completely after infection.
 - o Meningoencephalitis of unknown origin is also regularly seen in cats and although an underlying cause is rarely established it is often believed to be caused by viral infections.
- Trauma (although common in cats will not be discussed in this lecture).
- Anomalies as often seen in dogs with hydrocephalus and Chiari like malformations are uncommon in cats. The most common congenital anomaly is cerebellar hypoplasia sec. to feline panleukopenia infections during gestation.
- The most common metabolic/endocrine disease to cause signs of fore brain disease in cats is hyperthyroidism. Renal disease and hypertension are two other common causes of cerebral disease in cats. Metabolic disease such as portosystemic shunts do occur but are less common in cats than dogs.
- Idiopathic disease is also less common in cats than dogs but contrary what is stated in some textbooks, both idiopathic epilepsy and idiopathic (geriatric) vestibular disease are regularly seen in cats.
- Neoplastic disease is one of the most common causes where meningiomas and lymphoma are the most common types of neoplasia seen in cats. Meningiomas in cats are almost never invasive and generally holds a fair to good prognosis with surgical resection.
- Degenerative brain disease is generally seen in older cats where senile, cognitive dysfunction is the number one problem. This tends to present in different ways but the more common presentations are:
 - o Disorientation, abnormal behavior, uninterested in normal activities such as socializing, eating and grooming.
 - o Disturbed day/night cycle, restlessness at night and more sleeping during the day. House soiling, urinate/defecate



COMPANION ANIMAL

NEUROLOGY

A standard approach to diagnostic work up of a cat presenting with clinical signs associated to an intracranial disorder could typically be as follows:

- General physical examination (This may identify an underlying disorder such as cardiovascular disease or multifocal neoplastic disease).
- Neurological examination to establish the neuroanatomical localization – is it a focal or multifocal problem?
- Extensive blood exam to diagnose or exclude underlying hematologic or metabolic/endocrine disease.
- If indicated after the physical exam – thoracic radiographs or abdominal ultrasound exam may be warranted to look for underlying causes.
- If no underlying cause can be identified, next step would be advanced medical imaging where high field MRI is, by far, the modality of choice due to its ability of clearly depicting the cat brain and identifying cerebrovascular lesions such as ischemic infarcts and inflammatory/infectious disease.
- Depending on the imaging findings a cerebrospinal fluid sample may be obtained.