

## **Focus on Feline Ophthalmology**

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Cats: What is different?

Cats have some unique aspects that are important to consider when approaching the exam. In general, however, cats express less morphologic variability than dogs meaning that it is easier to get a handle on “normal”. Certain basic anatomic traits are unique to cats including a vertical pupil. Additionally, this pupil is innervated such that each side of the iris has a separate nerve supply. Certain diseases can take out one of the sides of innervation resulting in a D or reverse D pupil.

When considering basic parameters, consider that cats tend to be more stressed by the veterinary visit to the point that the pupil may not respond completely normally (dilated at rest, incomplete pupillary light reflex). Diagnostic tests can also be slightly different. In particular the Schirmer Tear Test results are very variable with normal tears averaging 18mm/min (9mm to 34mm). Thus, interpretation should involve balancing the hard number with the clinical signs. Normal intraocular pressure readings are 12.3mmHg +/- 4mmHg but ranges by 4-5mm during the day (highest in the morning and lowest at night). The tonopen underestimates IOP over 30mmHg and TonoVet is more accurate.

Cats can be reactive to drugs and preservatives. A large multicenter evaluation determined that topical polymyxin is associated with anaphylaxis and should be avoided if a comparable other medication is available. Treating and transporting cats can increase stress and exacerbate some clinical signs.

### **Eyelid Diseases**

Eyelid disease is uncommon in cats and is predominantly associated with neoplasia. Entropion can occur in fat faced tom but is more commonly seen as a secondary change after chronic corneal irritation. Surgical correction is less successful and a secondary surgery is often necessary. Eyelid tumors are more often malignant in cats. The most common tumors are squamous cell carcinoma, melanoma, apocrine hidrocystomas, spindle cell tumor and mast cell tumors. For this reason you should consider biopsy of FNA before surgical resection.

### **Conjunctivitis**

Conjunctivitis is overwhelmingly the result of infectious etiologies. This includes the ubiquitous herpesvirus, chlamydia and mycoplasma. Clinical signs will often start with an upper respiratory infection but persist past the resolution of respiratory signs.

Although conjunctival PCR can be diagnostic, there are often false negatives. Consider the history when making therapeutic decisions. Oral famciclovir (90mg/kg PO BID x 3 weeks), topical antivirals (Trifluridine, Cidofovir, Idoxuridine, vidarabine are variably effective). There is not a consensus on treatment and it may require an element of trial and error to find the best combination of therapy. Tetracyclines (oral and topical) or topical fluoroquinolones are good for chlamydia or mycoplasma.

## Cornea

Corneal sequestrum is uniquely cat disease resulting in a characteristic brown-black area of devitalized cornea. The disease is associated with brachycephalic facial conformation and seen in Persian and Himalayan breed. It is associated with chronic non-healing corneal ulcers in cats of all breeds and may require surgery to remove the dead cornea and allow healing.

Eosinophilic keratitis is an inflammatory condition of the cornea characterized by a vascularization and the formation of plaques on the corneal surface. Diagnosis is made by corneal cytology which demonstrates eosinophils. Traditional treatment consists of topical steroid therapy (pure dexamethasone or prednisolone acetate is preferred). Resistant cases may require anti-viral therapy in the form of oral famciclovir or topical anti-viral treatment. This disease is controlled rather than cured and may require intermittent treatment during outbreaks or low-grade long term anti-inflammatory treatment with either topical cyclosporine or steroid.

## Uvea:

Uveitis in cats is typically secondary to systemic disease although it can be idiopathic. A systemic workup looking for FIP, FeLV/FIV, cryptococcosis or lymphosarcoma is indicated. In cases where an underlying condition cannot be identified and controlled, long term changes to the eye should be monitored including glaucoma and lens luxation. Treatment for uveitis is focused on topical and systemic immune-suppression after infectious diseases have been ruled out.

Iris melanoma is the most common primary intraocular tumor in cats. The condition often presents as a slowly progressive, diffuse increase in iris pigmentation. Ultimately the iridocorneal angle may become involved and secondary glaucoma results. Although early monitoring with photos is appropriate, enucleation should be pursued if there is concurrent inflammation, glaucoma or if the pigmented areas are raised, velvety or extend into the iridocorneal angle.

## Lens

Cataracts are almost always the result of chronic uveitis in the cat. Congenital cataracts have been reported and cats do well with lens extraction surgery. As stated earlier, lens

luxation is also typically the result of chronic low-grade inflammation. Cats get lenticular sclerosis (nuclear sclerosis) as do other species with age.

## Retina

Hypertensive retinopathy is perhaps the most common and clinically important retinopathy of the cat. It should be considered in all cases of acute blindness in older cats. The retinal arteries autoregulate in response to increased systemic blood pressure. This results in vasoconstriction, focal necrosis and rupture of the vessel. These focal ruptures lead to multifocal areas of retinal edema or hemorrhage. The choroid does not autoregulate and as the blood pressure increases, there is choriocapillaris leakage resulting in serum beneath the retina and exudative retinal detachment. The incidence of ocular signs in hypertensive cats is about 40-60% and found mostly in cats over 10 years of age with systolic blood pressures greater than 168mmHg. The presence of ocular changes is an indication to start hypertensive therapy even if blood pressure measurements do not consistently meet the criteria for hypertension.

Clinical signs of hypertensive retinopathy can be unilateral but are typically bilateral. Presenting complaints include blindness, vision loss or progressively dilated pupils. Serous retinal detachment can often be diagnosed with a penlight from arm's distance. Retroillumination of the eye is achieved by holding a light arm's length from the patient. Retinal detachment results in a dampening of that reflection due to the fluid between the retina and the tapetum. Retinal examination is difficult during retinal detachment and the entire fundus may seem blurry. Focal areas of detachment will be blurry and hyporeflective and are sometimes associated with hemorrhage beneath, within or above the retina. Treatment for hypertensive retinopathy is focused solely on control of the systemic hypertension. No topical medications are indicated to treat the ocular component. Amlodipine has been demonstrated to be particularly effective in the resolution of systemic hypertension and hypertensive retinopathy. Although resolution of the hypertension typically results in re-attachment of the retina, the retina will likely continue to degenerate. Thus some cats who are visual at presentation or regain vision immediately after treatment may continue to go blind despite control of blood pressure.

Retinal degeneration can occur as a result of chronic retinal detachment, dietary insufficiencies or toxic causes. Taurine is an essential amino acid for the cat and must be ingested in the diet to maintain health. After the description of taurine deficiency and its associated retinopathy in 1975, commercial diets have been routinely supplemented with taurine. This has greatly decreased the incidence of the disease, however, deficiencies can be found in strays, patients fed homemade diets, and occasionally in patients with seemingly appropriate diet. Enrofloxacin toxicity was first identified in the mid 1990's when the dosing recommendations for cats were altered. After individual reports of rapid vision loss after systemic enrofloxacin administration, the toxicity was discovered to be a dose-related. Signs of retinal damage can be found in cats administered 25mg/kg or greater with 50mg/kg dosing resulting in retinal changes within days. Enrofloxacin should be reserved for severe diseases and doses should never exceed 5mg/kg q24h, PO. Additional caution should be exercised when administering the drug intravenously and when choosing treatment for older cats. Unlike dogs, the

incidence of heritable retinal degenerations is significantly smaller in the cat. Inherited retinal degenerations in the cat fall under the broad designation of progressive retinal atrophy or PRA.