Frightened of feline ophthalmology

Feline orbital disease

Claudia Hartley

Orbital disease in cats may be congenital in nature (microphthalmia, cyclopia, anophthalmia, optic nerve aplasia) due to inherited factors, toxins or idiopathic causes. More frequently feline orbital disease is encountered as an acquired disease and includes proptosis, orbital cellulitis, orbital foreign body, orbital abscessation, orbital emphysema and orbital neoplasia.

Orbital disease may be accompanied by clinical signs that include proptosis (globe protruded so that eyelids rest behind the equator of the globe), exophthalmos, enophthalmos, restricted ocular movements, engorged conjunctival/episcleral/scleral vessels, visual deficits or blindness, cranial nerve deficits (e.g. corneal sensation, pupil dysfunction, anisocoria), resistance to retropulsion of the globe, palpable bony swelling or crepitus, or pain on opening the mouth.

Proptosis in cats has a poor prognosis and is frequently associated with profound facial trauma (e.g. facial fractures), such as is sustained in road traffic accidents.

Orbital cellulitis is typically accompanied by exophthalmos and deviation of the globe with third eyelid protrusion at an early stage. Orbital cellulitis and abscessation is less common in cats compared with dogs, and is usually managed with a combination of drainage and systemic antibiotic and anti-inflammatory therapy. Dental procedures where the periosteal elevator slips from maxillary caudal cheek teeth roots may penetrate the orbit or globe. Pain on opening the mouth is often present.

Orbital emphysema is associated with frontal sinus penetration or disease. Cases present with combinations of exophthalmos, conjunctival swelling and palpable gaseous crepitus.

Orbital neoplasia is fairly common in cats, and is generally aggressive or malignant. Classically, cases present with exophthalmos, with or without deviation of the globe. They most commonly present insidiously but have been known to present more acutely (and it is speculated that this is due to acute perilesional swelling rather than rapid tumour growth). Two thirds are epithelial in origin with squamous cell carcinoma being the most common. Other tumour types include osteoma, fibrosarcoma, lymphosarcoma, teratoma and osteosarcoma. Evidence of bony lysis on diagnostic imaging is consistently associated with neoplasia.

Feline restrictive myofibrosarcoma (or orbital sclerosing pseudotumour) has been described. Cases present with insidious onset (weeks to months) of reduced ocular motility and blink ability. Cases tend to develop exposure keratitis

that may progress to corneal ulceration and ultimately perforation. Unilateral cases become bilateral with time. On histopathological examination, neoplastic spindle cells are seen to expand along fascial planes producing collagen and with minimal inflammatory cells.

KEY LEARNING OBJECTIVES

- Recognise when orbital disease is present
- Provide an appropriate differential diagnosis list
- Identify the most fruitful investigative tool (advanced imaging, ultrasonography, fine-needle aspirate etc.) to narrow the differential list

MULTIPLE CHOICE QUESTIONS

1. A cat is presented to you with proptosis of her right eye following a road traffic accident. What should you do next?
 - a. Anaesthetise the cat and enucleate the globe
 - b. Examine the patient, considering that skull fractures may be present
 - c. Anaesthetise the cat to place a temporary tarsorrhaphy
 - d. Start intravenous fluid therapy and reassess after 12 hours
2. Which of the following clinical signs are not indicative of orbital disease?
 - a. Exophthalmos
 - b. Pain on opening the mouth
 - c. Strabismus
 - d. Cataract
3. What is the most common orbital tumour in cats?
 - a. Melanoma
 - b. Lymphosarcoma
 - c. Squamous cell carcinoma
 - d. Restrictive myofibrosarcoma
4. A non-axial exophthalmos (deviated and protruding globe) is indicative of a lesion located where?
 - a. Intraconally (within the cone of extraocular muscles)
 - b. Extraconally (outside the cone of extraocular muscles)
 - c. Intraocularly
 - d. In the eyelids
5. Enophthalmos and entropion can be seen in older cats as a result of what?
 - a. Loss of retrobulbar fat
 - b. Glaucoma
 - c. Feline herpesvirus infection
 - d. Uveitis

Feline uveitis: just an eye problem?

David Maggs

Uveitis has few pathognomonic signs, which are often subtle in cats. Potentially blinding sequelae such as synechia, glaucoma, cataracts and retinal detachment or degeneration are common. Clinicians should suspect uveitis in cats with ocular signs and those showing lethargy, 'hiding', anorexia or fever.

Active and acute uveitis:

Delivered by Dr
Guest (guest)

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- Intraocular pain: blepharospasm, epiphora, lethargy, anorexia, hiding
- Iridal swelling: loss of normal 'texture' (use magnification and a focal light directed obliquely across the iris)
- Conjunctival or episcleral hyperaemia: subtle in cats
- Breakdown of the blood–ocular barrier: blood components in the anterior chamber, vitreous or subretinal space. One of the few pathognomonic signs of uveitis. Look for hypopyon (white blood cells), hyphaema (red blood cells), fibrin clumps, aqueous flare (albumin and other small proteins), keratic precipitates (white blood cells and inflammatory proteins clumped against the corneal endothelial surface) or exudative retinal detachment
- Miosis: best detected by retroillumination (see Top tips for your feline eye examination) or by resistance to dilation following application of tropicamide
- Corneal oedema
- Low intraocular pressure (IOP)
- Chronic (active) uveitis or previous uveitis:
- Intraocular pain: lethargy, anorexia, hiding
- Rubeosis iridis (iridal neovascularisation) evident as a reddish blush over iris face; indicates chronic active uveitis
- Scarring/adhesions:
 - Glaucoma (scarring of iridocorneal angle)
 - Anterior or posterior synechia (adhesions between the iris and corneal endothelium or lens, respectively)
 - Phthisis (globe contracture)
 - Retinal detachment (due to contraction of vitreous fibrin)

Viral

Feline infectious peritonitis (FIP)
Feline leukaemia virus (FeLV)*
Feline immunodeficiency virus (FIV)
Feline herpesvirus (FHV)

Parasitic

Cuterebra

Bacterial

Bartonella spp.
Mycobacterium spp.
Ehrlichia spp.*
*Borrelia burgdorferi**

Protozoal

Toxoplasma gondii
Leishmania spp.

Fungal/algal

Cryptococcus neoformans[†]
Histoplasma capsulatum[†]
Blastomyces dermatitidis[†]
Candida albicans
Coccidioides immitis[†]
Aspergillus spp.

Figure 1: Infectious causes of uveitis.

*Via immunosuppression or oncogenesis

[†]Chorioretinitis predominates

*Seroprevalence data: clinical evidence still being gathered

- Cataracts and corneal oedema/fibrosis/vascularisation (due to altered aqueous humour composition and circulation)
- Lens luxation due to enzymatic lysis or phagocytosis of zonules, cataract development, buphthalmos due to secondary glaucoma

DIAGNOSTIC APPROACH

Ocular testing (diagnoses uveitis):

- Retroillumination (assess for anisocoria)
- Flare assessment
- Tonometry
- Fluorescein staining
- Systemic testing (diagnoses likely cause):
- History and physical examination
- Complete blood count (CBC), biochemistry panel, urinalysis
- Serological/polymerase chain reaction (PCR) testing for infectious agents (Figure 1)
- Thoracic and abdominal imaging (± aspirates)
- Peripheral lymph node aspirates
- Aqueocentesis

Although a cause is found in only approximately 30% of cats, testing is essential to permit appropriate doses of steroids in the remaining 70% identified as idiopathic.

TREATMENT

- Treatment goals: treat causative antigen and rapidly control intraocular inflammation
- Corticosteroids: first choice when safe. Always start topically (if no corneal ulcer). Topical prednisolone acetate or dexamethasone will penetrate through cornea; hydrocortisone will not. Dose up to q2h if severe then taper. Use systemically once a cause responsive to corticosteroids has been found or those known to be worsened by corticosteroids have been eliminated
- Non-steroidal anti-inflammatory drugs (NSAIDs): less potent but useful in cats with diabetes, can often be administered systemically even when infectious disease is suspected or proven. General comments regarding dose and route made for corticosteroids apply equally to NSAIDs
- Atropine: paralyses iris sphincter and ciliary body muscles causing mydriasis and cycloplegia, respectively, which reduce pain and many complications of uveitis, but increase the chance of peripheral anterior synechia and glaucoma

KEY LEARNING OBJECTIVES

- To recognise the signs of acute and chronic uveitis in cats
- To understand the ocular and systemic diagnostic approach to detect uveitis itself and its causes, respectively
- To understand the risks and benefits of, and appropriately select, anti-inflammatory agents (type, dose, route, and taper) for treatment of cats with uveitis

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MULTIPLE CHOICE QUESTIONS

- Which of the following statements about signs of anterior uveitis in cats are true?
 - Typically are more overt than they are in dogs
 - Are – in the main – pathognomonic and easily recognisable
 - May include lethargy, corneal oedema and resistance to pupillary dilation
 - Include elevated intraocular pressure
- Which of the following statements about signs of anterior uveitis in cats are true?
 - May be used to aid in the differentiation of acute from chronic uveitis
 - Include phthisis in acute cases
 - Include anterior synechia as a result of adhesions between the lens and cornea
 - Require referral for detection
- Which of the following statements about diagnostic testing for the cause of uveitis in cats is true?
 - Is successful in about 70% of cases
 - Guides therapy whether a cause is found or not
 - Requires referral to an internal medicine specialist
 - Relies on testing of the eye only
- Which of the following statements about corticosteroids for the treatment of uveitis in cats is true?
 - Should not be used topically when an infectious cause is suspected or confirmed
 - Are less effective than NSAIDs
 - Should be withheld systemically until a cause is detected or at least until some causes have been eliminated
 - Should not be used systemically if a corneal ulcer is noted
- While awaiting diagnostic test results, what would a logical antibiotic choice for a cat with uveitis be?
 - Topically applied tetracycline
 - Systemically administered clavulanic acid–amoxicillin
 - A combination hydrocortisone–antibiotic ointment for the steroid component
 - Systemically administered doxycycline

Feline glaucoma: are you missing it?

Claudia Hartley

Unlike in canine patients, feline glaucoma cases frequently do not present with corneal oedema. A dilated pupil is often present in the affected eye, but it may also be mid-sized. Chronic glaucoma may be associated with enlargement of the globe (hydrophthalmos). This is usually more rapid in onset in kittens, so congenital glaucoma cases may present with buphthalmos early in the course of the disease. Hydrophthalmos may be associated with exposure keratitis and vascularisation, as well as secondary lens luxation as zonules are disrupted.

The normal feline intraocular pressure is 10–25 mmHg, depending on time of day and type of tonometer used. The applanation tonometer, TonoPen®, consistently underestimates feline intraocular pressure (IOP) at higher readings than the rebound tonometer TonoVet®. TonoPen® requires the application of local anaesthetic prior to use. Coupled with the increased area of corneal touch, this has been associated with increased incidence of iatrogenic corneal ulceration.

Glaucoma in cats is most commonly secondary to uveitis. Thus, treatment of the underlying uveitis is important, and may influence the progression of the secondary glaucoma. Secondary glaucoma may also occur due to intraocular neoplasia including lymphosarcoma and uveal melanoma.

Primary glaucoma is reported in cats (although uncommonly), notably in the Siamese, Burmese, Persian and European Shorthair breeds. In most primary cases the iridocorneal angle is open, but congenital glaucoma due to pectinate ligament dysplasia has also been reported.

Aqueous misdirection (or malignant glaucoma) is

uncommon and occurs when aqueous humour is misdirected into the vitreous cavity via small tears in the anterior hyaloid membrane. The lens is therefore pushed anteriorly resulting in a shallow anterior chamber, in addition to a raised IOP. Aqueous misdirection may be medically treated, but surgical removal of the lens in conjunction with anterior vitrectomy has also successfully controlled this condition.

Prostaglandin analogues are generally considered ineffective in cats, and given their pro-inflammatory properties they should be avoided. The topical carbonic anhydrase inhibitor dorzolamide has been shown to be efficacious in reducing IOP in both normal and glaucomatous cats. Brinzolamide, however, has been shown to be ineffective in reducing IOP in normal cats. Systemic carbonic anhydrase inhibitors in cats have been associated with inappetence, vomiting and lethargy, so are not recommended. The topical beta-blocker timolol reduces IOP in normal cats, although a study of combined dorzolamide and timolol treatment was not more effective than dorzolamide alone.

KEY LEARNING OBJECTIVES

- Recognise the subtle signs of glaucoma in cats
- Identify the most appropriate tonometer for use in cats
- Identify the most appropriate treatment for glaucoma in cats

MULTIPLE CHOICE QUESTIONS

- What is the normal intraocular pressure in cats?
 - 4–12 mmHg
 - 10–25 mmHg
 - 25–35 mmHg
 - 10–40 mmHg
- Feline glaucoma is most commonly which of the following?
 - Congenital