Ten Common Mistakes to Avoid in Managing Your Eye Cases

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The following list of "mistakes" has been compiled from thirty years of experience with referral examinations and phone consultations with veterinarians. During this time, I have noticed some recurring themes. My friend and colleague, Dr. Ken Abrams, presented this same topic at the Central Veterinary Conference in Washington, DC in May of this year. It is noteworthy that our lists were prepared independently, yet we identified several of the same "mistakes". I encourage you to also read his proceedings should you have the opportunity. Note that these proceedings discuss "ten common mistakes" rather than "the ten most common mistakes", as achieving a consensus with colleagues would be difficult. I believe most ophthalmologists would agree that the items on my list are problematic, but they are not presented in any particular order.

1. It's herpesvirus until proven otherwise

Cats with conjunctivitis and corneal ulcers comprise the two most common feline ocular conditions presented to our clinic. Either condition can be acute or chronic, unilateral or bilateral, and with or without respiratory symptoms. Most veterinarians appropriately treat feline conjunctivitis or ulcerative keratitis patients with an antibiotic. For conjunctivitis, this is appropriate because feline conjunctivitis is most often associated with infectious disease such as Chlamydophila, Mycoplasma, or feline herpesvirus (FHV). Empiric treatment is often prescribed that should be effective against the first two organisms (e.g., topical erythromycin or polymyxin/oxytetracycline, or oral azithromycin or doxycycline). Topical antibiotics are also appropriate to prevent bacterial infection of corneal ulcers, though the choice of antibiotic (e.g., tobramycin, gentamicin, ofloxacin) may differ from that for treatment of conjunctivitis. Many conjunctivitis and ulcer patients improve with antibiotic treatment alone, but what about those who do not? Cell samples from conjunctival or corneal scrapings can be submitted for cytology, immunofluorescent antibody (IFA), or polymerase chain reaction (PCR) testing for Chlamydophila or FHV. However, a negative test result does not preclude the diagnosis of either condition, but especially FHV where the incidence of false-negative results is relatively high. It should be assumed that most cats have been exposed to FHV at some time in their life, and approximately 40% will experience recrudescent infection later. Infection with FHV is arguably the most common cause of feline conjunctivitis, and it is definitely the most common cause of feline corneal ulcers. Therefore, if the conjunctivitis or ulcer does not quickly improve with antibiotic treatment, antiviral treatment should be started. My preference is idoxuridine, but trifluridine or cidofovir can also be used. Oral treatment (famciclovir) is appropriate for some patients.

2. Fly swatter or cannon

This next issue is related to the first above and also concerns FHV. L-lysine is an amino acid that has antiviral affects against FHV both in vitro and in vivo. L-lysine competes with arginine utilization by the virus. Lysine may be substituted for arginine during synthesis of viral proteins to act as an antimetabolite, it may compete with arginine for transport across cell membranes, and it induces arginase (the enzyme responsible for degradation of arginine). Lysine products are available for oral administration to cats and can be obtained as chewable treats, powder, gel, or paste (e.g., Enisyl, Viralys, etc.). Veterinarians often start treatment with lysine when FVH is suspected as causative of ocular disease, and this is appropriate. It is generally accepted that lysine will reduce the risk of recurrence and the severity and duration of FHV infection, but alone it may not be sufficient. Studies comparing the antiviral effects of lysine to other available antiviral treatments are not available, but clinical experience indicates that the latter agents (idoxuridine, famciclovir, etc,) are more effective.

3. Two eyes for a reason

Both eyes should be examined when a patient is presented for examination, and there are several reasons for this. Sometimes the perceived "normal" eye has occult disease. For example, I recently performed a screening eye examination on a show dog with no symptoms or obvious visual deficits, yet one eye had a complete retinal detachment. The owner was unaware of this. Also, examination of both eyes can facilitate assessment of the symptomatic eye. Consider the dog that has a mildly inflamed (red) eye with some discharge, yet the tear test of this eye is reasonably normal at 14 mm/minute. You then note that the Schirmer tear value of the noninflamed eye is only 10 mm/minute. What is happening here? It is likely that tear production of the inflamed eye is cycling, and there are times when tear of this eye is much lower. If you treat the eye with an antibiotic/steroid ointment to resolve the current inflammation and then check tear again in two weeks, you might find that tear production of this eye is now low. Finally, examination of both eyes can be helpful to determine variations of normal.

4. Lots of pressure for the average person

Tonometry is the measurement of intraocular pressure (IOP), and we most often talk about IOP in reference to glaucoma. However, assessment of the IOP can be helpful in the differential diagnosis of other conditions such as uveitis, and it should be performed prior to using certain drugs. We previously mentioned the necessity of examining both eyes, and this is especially true of IOP. The often quoted normal range of IOP for dogs and cats is 10-25 mmHg whether using a TonoPen (applanation), TonoVet (rebound), or even Schiotz (indentation) tonometer. This implies that an IOP greater than 25 mmHg is indicative of glaucoma, so does that mean than an IOP below 10 mmHg indicates uveitis? Some text books state this and talk about the IOP range as if it is absolute. In truth, the normal IOP range will vary with the instrument used, technique, examiner, degree of restraint, surface disease, and time of day. For example, when using a TonoPen, I often obtain lower IOP readings than others, and this is a matter of technique. In my hands, a normal IOP range is more like 6-20 mmHg rather than 10-25 mmHg. I see multiple pets daily with noninflamed eyes and IOPs of 6-10 mmHg, and be assured, these pets do not all have uveitis. What is probably more important than the absolute IOP determination is the difference between the two eyes when correlated with clinical signs. Let's say that dog A has an inflamed right eye (OD) and a noninflamed left eye (OS). The IOPs are 13 mmHg OD and 19 mmHg OS, respectively. In this example, the inflamed eye has a lower IOP than the normal eye, and this alone supports a diagnosis of uveitis. Under normal circumstances, the IOP of each eye should not differ by more than 2-3 mmHg. What about dog B that is presented for animal examination (vaccinations, etc) where the client has no concerns, and both eyes are visual and noninflamed? You check this dog's IOPs and obtain readings of 30 mmHg for both eyes (OU). Certainly you should pause to consider whether this pet has glaucoma, but given the history and presentation, it is more likely that the IOPs are artificially elevated from errors in technique or restraint. You might wish to refer this pet for a second opinion, especially if it is a low risk breed for glaucoma. And finally, what about dog C (a Cocker Spaniel) that presents with OD normal and OS inflamed? The IOPs are 10 mmHg OD and 19 mmHg OS. In the instance, the red eye has an IOP that is technically within the normal range, but given the breed (high-risk) and higher IOP in the inflamed eye, this dog may be on the verge of glaucoma.

5. This one rubs (pun intended) me wrong

Corneal ulcers vary in depth and are generally classified as superficial or deep. One specific type of superficial ulcer is the indolent ulcer (aka Boxer or refractory ulcer, recurrent erosion, or spontaneous chronic corneal epithelial defect). These ulcers usually occur in dogs over 6 years of age and are typically chronic, superficial with loose epithelial edges, non-infected, minimally to moderately painful, and have variable vascular infiltrates. Some breeds are predisposed to develop this type of ulcer (e.g., Boxer, Golden retriever, Corgi, etc.). Epithelial debridement, linear or punctate keratotomy, and corneal burr polishing are currently accepted treatments. However, these treatments are only appropriate for superficial corneal ulcers and <u>should never</u> be performed on a deep ulcer, as rupture of the globe is possible.

6. You'll cry later

One of the most common eye diseases of dogs is keratoconjunctivitis sicca (KCS), or dry eye. The symptoms can vary, but KCS can literally be diagnosed in one minute (or two minutes if you test each eye separately). Despite this, many veterinarians forget to check tear production when confronted with an irritated eye. The Schirmer tear test (STT) is used to confirm the diagnosis. The Schirmer tear test-1 is most often used and is performed prior to application of diagnostic reagents to the eye. The STT-1 measures both reflex and basal tear production. The Schirmer tear test-2 is performed after topical anesthetic has been applied to the eye, and thus, measures primarily basal tear production. The normal STT-1 value is >15 mm of wetting after one minute for both dogs and cats. The significance of STT-1 values between 10-14 mm/minute should be interpreted with clinical signs, but values <10 mm/minute denote clinical KCS. Cats are an exception to this latter point. Low STT-1 values are common in cats with non-inflamed and otherwise normal eyes, though the published normal values are similar to that of dogs. Therefore, the difference in STT-1 values between the eyes may be more important for interpretation in cats than the absolute value (similar to IOP measurement). <u>The STT-1 should be performed on any pet with an irritated eye, ocular discharge, or corneal disease of undetermined cause</u>. Because the tear test and diagnosis of KCS is simple, you may cry if you forget to do this one.

7. Topical NSAIDs are not always better

Topically applied nonsteroidal anti-inflammatory drugs (NSAIDS) such as flurbiprofen, diclofenac, and ketorolac are now prescribed by many general practitioners. Their primary indications are for the treatment of uveitis and immediately prior to cataract surgery. I have noted in recent years that more veterinarians are routinely prescribing topical NSAIDs for the treatment of corneal ulcers. The presumed rationale for this is analgesia and treatment of the secondary uveitis that occurs with corneal ulcers. In many instances this may be acceptable. However, all topically applied NSAIDs delay corneal healing, and they may impede corneal vascular infiltrates necessary for corneal stromal healing. It is true that they are less likely than steroids to promote proteolytic degradation of the cornea (i.e., melting), but to believe they have no effect on surface healing is erroneous. Some of the package inserts for these drugs indicate they have potential to cause keratitis, corneal thinning, and even corneal rupture. Flurbiprofen, in particular, often stings when applied

to an ulcerated eye. I personally do not use topical NSAIDs for treatment of corneal ulcers unless the associated uveitis is severe and there are few other options. For pets with painful corneal ulcers, I prefer oral NSAIDs (e.g., meloxicam, robenacoxib) for analgesia in association with medications such as tramadol (dogs) or buprenorphine (cats). Topical NSAIDs also have potential to increased intraocular bleeding and intraocular pressure, and therefore, should be used cautiously if at all in pets with hyphema or potential for glaucoma.

8. Don't you want to know the diagnosis?

Sometimes histopathology is critical not only for diagnosis, but also prognosis. Histopathology results may also determine specific, additional, or adjunctive treatments. It is not always possible to submit tissue for histopathology because of financial constraints, but at least pause to consider it. Since many laboratories now provide formalin jars as a courtesy (i.e., at no cost to you), consider keeping specimens until the case or disease has resolved to your satisfaction. Too often tissue is simply thrown in the trash. Instances where histopathology should be seriously considered include glaucoma of undetermined cause, any blind and painful eye of undetermined cause, intraocular tumor, and recurrent lid tumors.

9. Re-examination is as important as the initial diagnosis and treatment

Eye diseases can change quickly, and there is sometimes little margin for error. Consider the glaucoma dog where you correctly diagnosis glaucoma (let's say the IOP was 54 mmHg), you administer appropriate hypotensive treatments to reduce the IOP, and you tell the client to come back in a month. There is a reasonable chance that when this pet returns, the affected eye will be blind. What happened here? Well the glycerin or mannitol that you administered for rapid reduction in pressure was out of the dog's system in 12-24 hours, and the drops dispensed were insufficient to control the pressure. Another instance is the eye that appears to have a simple conjunctivitis or mild uveitis, you correctly start steroids, and a few days later the dog comes back with glaucoma. It turns out this dog was a high incidence breed for glaucoma, and if the pressure was high-normal at the time of initial examination, he or she was probably already on the verge of glaucoma. Remember that with uveitis the pressure tends to be low, so when it is corrected, the pressure sometimes exceeds normal limits. Deep or infected corneal ulcers should also be seen soon after initial examination. The take home message is that for some eye diseases, re-examination in 24-48 hours is appropriate, and if in doubt, error on the side of seeing the pet back sooner rather than later.

10. Don't stop treatment too soon

Many eye diseases require long-term or lifetime treatment. Well intended veterinarians often make the correct diagnosis and start appropriate treatment but then stop treatment once the eye has improved. Examples include cats with eosinophilic keratitis, uveitis cases (where treatment should often be tapered over several weeks or more), and dry eye. Yes, that cyclosporine or tacrolimus may have improved tear production, but tear production will probably decline if the treatment is discontinued. Even for pets with dry eye where tear production never improves, drugs like cyclosporine and tacrolimus slow progression of the corneal disease, improve comfort, and prolong vision. Depending on the condition, I will sometimes instruct a client to continue a treatment twice weekly (e.g., Monday and Thursday). This frequency of treatment is unlikely to have adverse effects but can be beneficial and makes the owner look at the eye(s) at least twice a week. Examples include early cataract susceptible to lens-induced uveitis, or the Golden retriever where early pigmentary uveitis is suspected but symptoms are subtle.