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DIAGNOSIS AND TREATMENT OF DISEASES OF THE LENS

The function of the lens is to help focus the light onto the retina. The adult lens is an avascular structure that is attached to the ciliary body by a double row of zonules. Accommodative power of the dog and cat lens is low as compared to human beings. The adult lens continues to grow during life, resulting in sclerosis of the nucleus in dogs and cats. This starts at approximately 6 years of age in dogs, but is usually not seen until at least 10 years of age in cats. Nuclear sclerosis does not interfere with vision like cataract formation does. However, in old dogs, a decrease in close-up vision may be apparent to the owner.

Cataract

Cataract is an opacity of the lens. Cataracts can be classified according to etiology, location, size and age of onset.

The most common etiology of cataract formation in dogs is a genetic predisposition for cataract. Diabetes mellitus is the second most common cause for cataracts in dogs, followed by chronic uveitis and retinal degeneration. Other less common causes include trauma, radiation and nutritional cataracts. The most common cause for cataract in cats is chronic uveitis, followed by a genetic predisposition for cataract formation. Other causes for cataract are rare in cats.

Cataracts can be nuclear, cortical or capsular. In the cortex, they can be anterior, posterior or equatorial. Slitlamp biomicroscopy is helpful to determine the location of the cataract. Generally speaking, a cataract in the anterior half of the lens will move with the direction of the eye. A cataract in the posterior half of the lens will move against the direction of the eye. Because lens fibers are formed in the equator of the lens, equatorial cataracts are likely to progress. Nuclear cataracts are formed prior to birth and are unlikely to progress during life.

An incipient cataract is a pinpoint cataract. An immature cataract is more than a pinpoint cataract, but does not involve the entire lens. A mature cataract is a blinding

cataract as it involves the entire lens. As time progresses, the cataractous lens fibers may slowly break down and the cataract can become hypermature. In very young dogs, this process may occasionally result in return of vision. During the breakdown of the lens fibers, lens proteins may leak through the intact lens capsule and cause lens-induced uveitis. This should be treated with topical steroid medications such as 1% prednisolone acetate or 0.1% dexamethasone. In diabetic animals, non-steroidal anti-inflammatory medications such as 0.03% flurbiprofen or 0.1% diclofenac can be used. Intumescent cataracts are cataracts that are larger than normal. They are most commonly seen in diabetic dogs. Spontaneous lens capsule rupture is possible in diabetic cataracts. Generally speaking, a juvenile cataract is a cataract in a dog of 6 years of age or less. Senile cataracts are cataracts seen in older dogs. Age of onset is less important in the management of cataracts than size and etiology.

Treatment of cataract

The only treatment for cataract is cataract surgery. This procedure has a high success rate in dogs, but the owners need to be warned that the process is much more involved in dogs and cats than people. Generally speaking, the first step is to perform an electroretinogram to test the function of the retina if not visible through the cataract. This procedure can either be performed on an awake animal, or under sedation or general anesthesia. An ocular ultrasound is performed to evaluate the position of the retina, the clarity and stability of the vitreous and to look for possible breaks in the lens capsule, especially in diabetic dogs. Lens removal is performed by phacofragmentation and aspiration of the lens. During this process, the lens is fragmented using high frequency ultrasound and the fragments are aspirated using the same tip through a small incision. After removal of the cataractous lens material, an artificial lens can be placed within the existing lens capsule. Aftercare is intense and includes wearing a protective Elizabethan Collar for several weeks, application of topical steroids and antibiotics four times a day initially as well as anti-inflammatory medications and antibiotics by mouth. The frequency of the topical medications is slowly decreased over a number of months after surgery. Frequent follow up visits are needed after surgery. Success rate of cataract surgery is high, but owners do need to be aware of possible complications including excessive intraocular scar tissue formation, glaucoma and retinal detachment.

Lens luxation

Lens luxation can be primary or secondary. A genetic zonular disorder can cause spontaneous luxation of the lens in predisposed breeds such as the Jack Russell Terrier. Luxation usually happens in young to middle aged dogs and is often bilateral, but not at the same time. Treatment consists of removal of the luxated lens by either cryo extraction or phacofragmentation. It is not possible to place an artificial intraocular lens as is done in routine cataract surgery as this lens is placed within the existing lens capsule. It is possible to suture in an artificial lens after lens removal, however this may increase the risk of complications such as retinal detachment, bleeding or glaucoma.

Etiologies of secondary lens luxation include chronic uveitis with cataract formation, glaucoma and trauma. A normal lens is firmly attached to the ciliary body and a significant amount of trauma is needed to dislocate a normal lens. Additional significant ocular lesions such as vitreous hemorrhage and retinal detachment are usually present. A lens that has luxated secondary to chronic cataract and low grade uveitis can be removed provided the electroretinogram and ocular ultrasound are normal. Lens luxation as a result of glaucoma is usually seen in buphthalmic blind eyes, and removal of the lens is not indicated. Instead, enucleation should be considered to remove a painful blind eye.