

# INFLAMMATION OF THE BACK PART OF THE EYE (CHORIORETINITIS)

## BASICS

### OVERVIEW

- Inflammation of the choroid and retina; the choroid is located immediately under the retina and is part of the middle-layer of the eyeball that contains the blood vessels; the retina contains the light-sensitive rods and cones and other cells that convert images into signals and send messages to the brain, to allow for vision
- Choroid is also called “posterior uvea;” the uvea is the entire middle layer of the eyeball that contains the blood vessels; it is composed of the iris (the colored or pigmented part of the eye), the ciliary body (the area between the iris and the choroid), and the choroid (located under the retina)
- Diffuse inflammation may result in frank separation of the back part of the eye (retina) from the underlying, vascular part of the eyeball (known as the “choroid;” condition known as “retinal detachment”)

### SIGNALMENT/DESCRIPTION of ANIMAL

#### *Species*

- Dogs and cats

#### *Breed Predispositions*

- Generalized (systemic) fungal infections (known as “mycoses”)—more common in large, hunting-breed dogs
- Uveodermatologic syndrome—a rare syndrome in which the animal has inflammation in the front part of the eye, including the iris (known as “anterior uveitis”), inflammation of the posterior uvea or choroid (known as “posterior uveitis”), or both and coexistent inflammation of the skin (known as “dermatitis”), characterized by loss of pigment in the skin of the nose and lips; Akitas, chows, and Siberian huskies are more likely to develop syndrome than other breeds
- Borzoi breed-specific eye disorder with multiple areas of fluid build-up in the retina (known as “retinal edema”) or loss of tissue in the choroid and retina (known as “chorioretinal atrophy”) resulting in deterioration of the back of the eye (retina), causing pigmented and hyper-reflective areas (known as “Borzoi chorioretinopathy”)

#### *Mean Age and Range*

- Depend on underlying cause

#### *Predominant Sex*

- Uveodermatologic syndrome— a rare syndrome in which the animal has inflammation in the front part of the eye, including the iris (anterior uveitis), inflammation of the posterior uvea or choroid (posterior uveitis), or both and coexistent inflammation of the skin (dermatitis), characterized by loss of pigment in the skin of the nose and lips; more common in young male dogs

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Not usually painful, except when the front part of the eye, including the iris (anterior uvea) is affected
- Vitreous abnormalities—the “vitreous” is the clear, gel-like material that fills the back part of the eyeball (between the lens and the retina); may note inflammatory substances (known as “exudates”), bleeding (hemorrhage), or evidence of the gel becoming liquified (known as “syneresis”)
- Interruption or change of course of the blood vessels in the back of the eye (retina) due to changes in the contour/surface of the retina
- Invasion of the eye by fly larvae (known as “ophthalmomyiasis); usually seen in cats—tracts from migrating larvae may be seen when the eye is examined with an ophthalmoscope
- Changes in the appearance of the retina when examined with an ophthalmoscope; may include change in color, darkened or lighter areas, and scars
- Other signs related to underlying disease
- Few or small lesions—may note no apparent visual deficits

### CAUSES

#### *Dogs*

- Viral infection—canine distemper virus; herpesvirus (rare, usually seen in newborn puppies); rabies virus
- Bacterial or rickettsial infections—generalized disease caused by the spread of bacteria in the blood (known as “septicemia” or “blood poisoning”) or bacteria in the blood (known as “bacteremia”); leptospirosis; brucellosis; inflammation with accumulation of pus in the uterus (known as “pyometra”) that leads to toxic inflammation of the uvea (uveitis); *Borrelia* (Lyme disease); ehrlichiosis; Rocky Mountain spotted fever; bartonellosis
- Fungal or mycotic infection—aspergillosis; blastomycosis; coccidioidomycosis; histoplasmosis; cryptococcosis
- Algal infections—geotrichosis; protothecosis

- Parasitic—migration of parasitic larvae through the eye (known as “ocular larval migrans;” parasites include *Strongyles*, *Ascarids*, *Baylisascaris*); toxoplasmosis; leishmaniasis; *Neospora*; invasion of the eye by fly larvae (ophthalmomyiasis)
- Autoimmune disease—diseases in which the immune system attacks the body’s own tissues; examples include uveodermatologic syndrome (a rare syndrome in which the animal has inflammation in the front part of the eye, including the iris [anterior uveitis], inflammation of the posterior uvea or choroid [posterior uveitis], or both and coexistent inflammation of the skin [dermatitis], characterized by loss of pigment in the skin of the nose and lips) and systemic lupus erythematosus (autoimmune disease in which body attacks its own skin and other organs)
- Unknown cause (so called “idiopathic disease”)—Borzi chorioretinopathy is an acquired syndrome where affected dogs have multiple areas of fluid build-up in the retina (known as “retinal edema”) or loss of tissue in the choroid and retina (known as “chorioretinal atrophy”); possibly genetic, but may be caused by some type of infection

### **Cats**

- Viral infection—feline leukemia virus (FeLV); feline immunodeficiency virus (FIV); feline infectious peritonitis (FIP)
- Bacterial infection—generalized disease caused by the spread of bacteria in the blood (septicemia or blood poisoning) or bacteria in the blood (bacteremia); bartonellosis
- Fungal or mycotic infection—cryptococcosis; histoplasmosis; blastomycosis; others
- Parasitic—toxoplasmosis; invasion of the eye by fly larvae (ophthalmomyiasis)—fly larvae include Diptera, *Cuterebra*; migration of parasitic larvae through the eye (known as “ocular larval migrans); leishmaniasis (one report)
- Protozoal infection—toxoplasmosis
- Autoimmune disease—diseases in which the immune system attacks the body’s own tissues; examples include periarteritis nodosa and systemic lupus erythematosus (autoimmune disease in which body attacks its own skin and other organs)

### **Dogs and Cats**

- Infection introduced by some external event—wound that enters the eyeball or migrating foreign body; surgery that enters the eyeball (known as “intraocular surgery”)
- Infection spread through the blood or body tissues to the eyeball—generalized (systemic) disease spreading into the eye; may extend from the central nervous system via the nerve between the brain and the eye (the optic nerve)
- Metabolic—early lesions in the back part of the eye (retina) secondary to high blood pressure (known as “hypertensive retinopathy lesions”) may appear as multiple areas of inflammation of the retina (known as “multifocal retinitis”)
- Generalized disease caused by the spread of bacteria in the blood (septicemia or blood poisoning) or bacteria in the blood (bacteremia)—bacterial or fungal infection of the intervertebral disks and adjacent bone of the spine (vertebral bodies; condition known as “diskospondylitis”); inflammation/infection of the lining of the heart (known as “endocarditis”); inflammation with accumulation of pus in the uterus (known as “pyometra”); may result from primary infection or associated immune-complex disease
- Cancer—primary cancer involving the choroid and/or retina or secondary to the spread of cancer into the back part of the eye (known as “metastasis”)
- Immune-mediated disease—may cause inflammation of blood vessels (known as “vasculitis”) or inflammation of the choroid and/or retina, resulting in separation of the back part of the eye (retina) from the underlying, vascular part of the eyeball (retinal detachment)
- Unknown cause (idiopathic disease)—common
- Toxicity—antifreeze (ethylene glycol); individual animal reaction to medications (such as trimethoprim-sulfa)
- Trauma

### **RISK FACTORS**

- Feline leukemia virus (FeLV) or feline immunodeficiency virus (FIV) infection may increase the likelihood that a cat will become infected with other disease-causing agents that involve the eye (such as *Toxoplasma*) that cause inflammation of the back part of the eye (choroid and retina)
- Dogs or cats on medications to decrease the immune response for other medical problems

## **TREATMENT**

### **HEALTH CARE**

- Depends on physical condition of patient
- Usually outpatient
- Fluid or other therapy for generalized (systemic) disease

### **MEDICATIONS**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Identify and treat any underlying, generalized (systemic) disease, such as itraconazole for a fungal infection (known as “systemic mycosis”); doxycycline for rickettsial infection; azithromycin for bartonellosis

- Medications applied directly to the surface of the eye (known as “topical medications”)—are not effective for treatment of chorioretinitis in dogs with intact lenses (the lens [singular] is the normally clear structure directly behind the iris that focuses light as it moves toward the back part of the eye [retina])
- Generalized (systemic) therapy is administered by injection or by mouth (orally)—required for treatment of inflammation of the back part of the eye (choroid and retina; “chorioretinitis”)
- Feline toxoplasmosis—clindamycin for 14 to 21 days
- Systemic steroids administered by mouth (such as prednisone) at anti-inflammatory doses—when generalized (systemic) fungal infection (mycosis) has been ruled out or is being treated with appropriate systemic antifungal therapy; avoid use, unless large areas of the retina are affected and vision is threatened severely
- Systemic steroids administered by mouth (such as prednisone) at doses to decrease the immune response (immunosuppressive doses) for immune-mediated disease; may facilitate separation of the back part of the eye (retina) from the underlying, vascular part of the eyeball (retinal detachment)
- Topical steroids applied directly to the eye (such as 1% prednisolone acetate or 0.1% dexamethasone) and atropine (1%) to dilate the pupil and reduce pain—for inflammation of the uvea (known as “panuveitis” in which inflammation involves both the front part of the eye, including the iris [known as “anterior uveitis”] and the back part of the eye [choroid])
- Treatment for increased pressure in the eye (glaucoma)—as appropriate for secondary glaucoma in which the pressure within the eye [intraocular pressure] is increased secondary to inflammation in the eye
- Cancer—chemotherapeutic agents
- Uveodermatologic syndrome (a rare syndrome in which the animal has inflammation in the front part of the eye, including the iris [anterior uveitis], inflammation of the posterior uvea or choroid [posterior uveitis], or both and coexistent inflammation of the skin [dermatitis], characterized by loss of pigment in the skin of the nose and lips)—may require azathioprine (a medication that decreases the immune response) and steroids to control inflammation

## FOLLOW-UP CARE

### PATIENT MONITORING

- As appropriate for underlying cause and type of medical treatment
- Blood work, including a complete blood count (CBC), platelet count and serum biochemistry tests for liver enzymes—if giving azathioprine
- Monitor intraocular pressure (IOP)—for cases with inflammation of the front part of the eye, including the iris (anterior uveitis) to determine if the pressure is increasing and possible glaucoma is developing

### PREVENTIONS AND AVOIDANCE

- Tick and flea control measures to prevent infection with various disease-causing agents (such as *Borrelia* that causes Lyme disease)

### POSSIBLE COMPLICATIONS

- Permanent blindness
- Cataracts (opacity in the normally clear lens, preventing passage of light to the back part of the eye [retina])
- Glaucoma (increased pressure in the eye)
- Long-term (chronic) eye pain
- Death—secondary to underlying, generalized (systemic) disease

### EXPECTED COURSE AND PROGNOSIS

- Prognosis for vision—guarded to good, depending on amount of retina affected; visual deficits or blindness may develop if large areas of the retina were destroyed; localized (focal) disease and multiple areas of disease (multifocal disease) of the retina do not impair vision markedly, but do leave scars
- Prognosis for life—guarded to good, depending on underlying cause

## KEY POINTS

- Chorioretinitis may be a sign of a generalized (systemic) disease; therefore, appropriate diagnostic testing is important
- Immune-mediated disease requires lifelong therapy to control inflammation of the back part of the eye (choroid and retina)
- Dogs with uveodermatologic syndrome also may have inflammation of the front part of the eye, including the iris (anterior uveitis) and secondary glaucoma (in which the pressure within the eye [intraocular pressure] is increased secondary to inflammation in the eye), which require treatment; inflammation of the skin (dermatitis) also may require management