Ocular Manifestation of Systemic Disease

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Common Ophthalmic Findings with Systemic Disease

Congenital
Immune Mediated
Infectious
Neoplastic
Metabolic
Toxicity/Miscellaneous

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Congenital Diseases

- Hydrocephalus
- Dwarfism
- Coat Color Related Diseases

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Hydrocephalus

- Toy and Brachycephalic breeds
- Open fontanelle
- Ventrolateral strabismus
- Vision deficits +/- neurologic deficits

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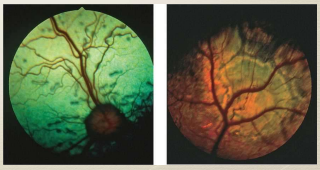
Dwarfism

- Ocular skeletal dysplasia
- Labrador Retriever
- Retinal dysplasia +/- detachment
- Chondrodysplasia
- Autosomal recessive for skeletal changes
- Incomplete dominant for ocular changes



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Color coat related changes

- Blue iris and deafness
  - 30% of dalmatians in US deaf
- Merle ocular dysgenesis

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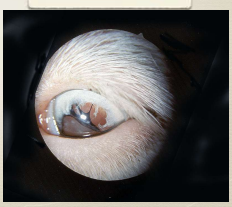
Merle Ocular Dysgenesis

- Microophthalmia
- Iris hypoplasia and coloboma
- Corectopia
- Dyscoria
- Cataracts
- Retinal dysplasia and detachment
- Choroidal hypoplasia



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Immune Mediated Diseases

- Dermatologic diseases
- Masticatory Muscle/Extraocular Myositis
- Uveodermatologic Syndrome
- Sudden Acquired Retinal Degeneration/Immune Mediated Retinitis

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Dermatologic Diseases

- Pemphigus
- Discoid Lupus
- Blepharitis
- Atopy and allergic conjunctivitis
- Treatment includes topical steroids and systemic immunosuppressents

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Masticatory muscle and Extraocular Muscle Myositis

- Young to middle age dog
- Medium to large breed
  - Golden Retriever
- Acute muscle swelling, pain, atrophy
- Exophthalmos
- Elevated third eyelid
- Type 2M fiber antibodies

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Uveodermatologic Syndrome

- Arctic circle breeds
  - Akita, Siberian Husky
- Immune mediated destruction of melanocytes
- Ocular signs precede dermatologic changes
- Uveitis
- Chorioretinitis
- Secondary cataracts and glaucoma
- Vitiligo
- Poliosis
- Nasal planum depigmentation
- Guarded prognosis for vision retention
- Long term immunosuppresive therapy

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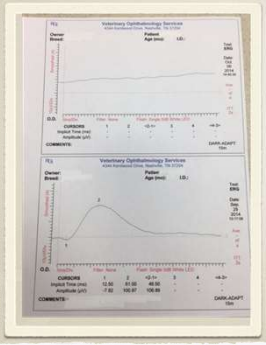
Sudden Acquired Retinal Degeneration/Immune Mediated Retinitis



- Middle age female spayed dogs over represented
- Polydypsia/Polyuria (30%)
- Polyphagia (37%)
- Weight Gain (57%)
- Elevated Alkaline Phosphatase and Cholesterol (40%)
- Near normal fundic examination
- Delayed Pupillary light reflexes
- Extinguished ERG (electroretinogram)
- No proven treatment for SARD
- Immune mediated retinitis variable response to Prednisone and Doxycycline

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Uveitis associated with Infectious and Neoplastic Diseases

- Bacterial
- Mycotic
- Neoplastic

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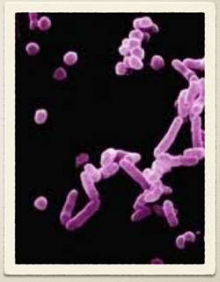
Bacterial

- Bacteremia
- Lyme Disease
- Rickettsial diseases
- Leptospirosis
- Brucellosis



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Anterior Uveitis

- Pain/photophobia
- Conjunctival hyperemia/episcleral injection
- Aqueous flare
- Cellular flare
  - Hyphema
  - Hypopyon
- +/- Miosis
- Iris swelling/hyperemia/hemorrhage
- Ocular hypotony or secondary glaucoma

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Mycotic

- Blastomycosis
  - Most commonly mycosis seen in dogs
- Aspergillosis
  - German Shepherd
- Coccidioidomycosis
  - Valley Fever
  - SW United States
- Cryptococcosis
  - More commonly seen in cats
- Histoplasmosis

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Mycotic

- Posterior uveitis
  - Granulomatous chorioretinitis
- Anterior uveitis extension of posterior disease

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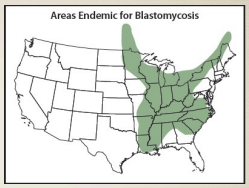
Blastomycosis



- Ohio and Tennessee River Valley
- Severe chorioretinitis with retinal detachment and secondary glaucoma
- Enucleation often required

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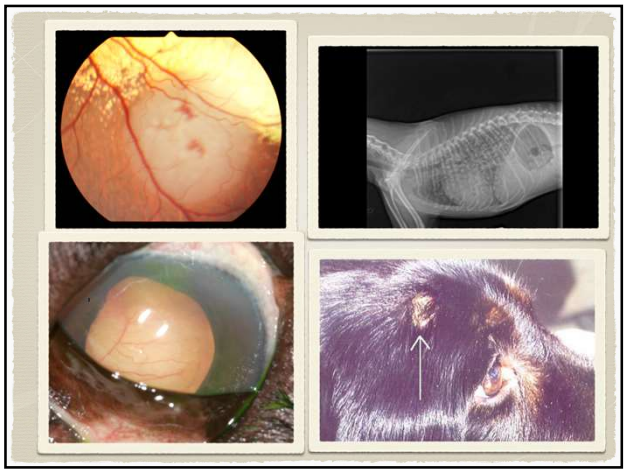

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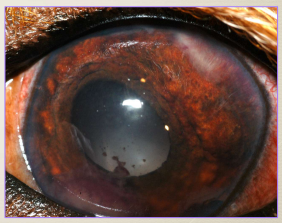
Neoplasia

- Lymphoma most common secondary neoplasia
- Histiocytic sarcoma/malignant Histiocytosis
- Choroidal lesions can be seen with metastatic neoplasia



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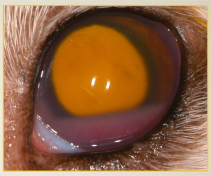
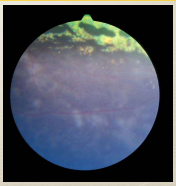
Lymphoma

- Hypopyon
- Hyphema
- Infiltrative iris lesions/nodules
- Perivascular retinal infiltrate





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Ophthalmic and Systemic Work-up

- Tonometry
- Fluorescein staining
- Fundic Examination
- CBC
- SuperChem
- Urinalysis
- Thoracic Radiographs
- Rickettsial titers
- Fungal Antigen Testing
  - MiraVista
- Lymph node aspirates
- Biopsy/cytology of skin lesions
- Abdominal ultrasound
- Ocular centesis
  - Cytology/culture of aqueous or vitreous
- +/- Enucleation with Histopathology

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Metabolic Diseases

- Diabetes Mellitus
- Hypothyroidism
- Hyperadrenocorticism (Cushing's Disease)
- Hyperlipidemia

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Diabetes Mellitus

- Cataract formation
- Reduced corneal sensitivity
- Keratoconjunctivitis Sicca
- Diabetic retinopathy
- Neuropathies (Horner's syndrome, neurogenic KCS, Facial nerve paralysis)

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Managing Diabetic Cataracts

- Cataracts develop quickly with rapid progression
  - 85% of dogs develop blinding cataracts within 9 months of developing DM
- Phacolytic/phacoclastic uveitis common
- Refer early
- Ophthalmic steroids/NSAIDs to control uveitis
- Monitor for secondary glaucoma

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Diabetic Cataract Surgical Candidate

- ERG and ocular ultrasound
- CBC
- Serum Chemistry
- Fructosamine
- Glucose curve/continuous glucose monitor
- Urinalysis
- Urine Culture
- +/- Dental prophy
- Uveitis, IOP, and STT controlled

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Continuous Glucose Monitoring

- Glucose "curves" at home with increased accuracy
- Device can be kept in place several weeks
- Freestyle Libre

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Diabetes Mellitus

- Decreased corneal sensation
- Increased risk of Keratoconjunctivitis Sicca
- Hyperlipidemia/Lipid laden aqueous

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Hyperlipidemia

- Acute lipid laden aqueous
- Bilateral may cause blindness
- May occur spontaneously or associated with uveitis
- Miniature Schnauzer
- Shetland Sheepdog
- Diabetes Mellitus
- Cushing's Disease
- Pancreatitis
- Treat uveitis and any underlying disease
- CBC/Serum Chemistry/Triglycerides/Cholesterol
- Treat lipemia
  - Gemfibrozil or other statin
  - Low fat diet
  - Omega 3 Fatty Acids

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Hypothyroidism

- Associated with Keratoconjunctivitis Sicca
- Horner's Syndrome
- Corneal dystrophy
- Difficulty in healing (ulcerative keratitis)
- Neuropathies (Facial nerve paralysis, Horner's syndrome)

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Cushing's Disease

- Decreased healing time
- Increased risk of infection
- Corneal lipid dystrophy/degeneration

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Miscellaneous Diseases

- Viral
  - Canine Distemper Virus
  - Canine Adenovirus
- Systemic Hypertension
- Toxicity
  - Sulfonamides
  - Ivermectin
  - Enrofloxacin

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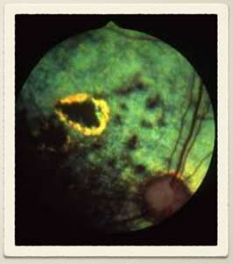
Canine Distemper Virus

- Keratoconjunctivitis Sicca
- Chorioretinitis
  - "Gold Medalion" lesions from previous chorioretinitis
- Optic neuritis and blindness due to other CNS disorders



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Canine Adenovirus

- Corneal edema associated with corneal endothelial damage
  - "Blue Eye"
- Uveitis
- Natural disease or vaccine induced
  - Afghan Hound overrepresented with vaccine induced corneal edema
  - Vaccinate with CAV2 to protect against CAV1 (reduced vaccine induced reactions)

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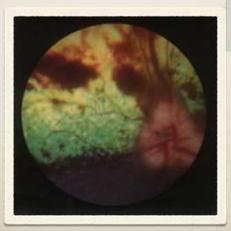
Systemic Hypertension

- Indirect blood pressure measurements >220 mmHg lead to retinal detachments
- Measure BP on any dog with hyphema, intraretinal hemorrhage, or retinal detachment
- Treat underlying cause
  - Renal Disease
  - Cushings Disease
  - Cardiac Disease
- Enalapril
- Benazapril
- Amlodipine



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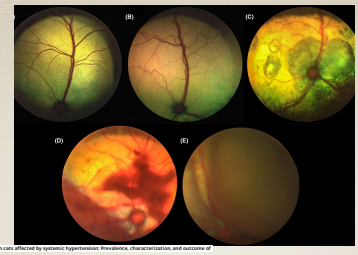

Ocular fundus abnormalities in cats affected by systemic hypertension: Prevalence, characterization, and outcome of treatment

Alessandro Cirla, Michele Drigo, Valentina, Andreani, Giovanni Barsotti

First published: 20 January 2021

https://doi.org/10.1111/vop.12862

Clinical grading of fundus lesions secondary to SHP. Grade 0: no noticeable fundus abnormalities, but clinically diagnosed with SHP (A); grade 1: increased arterial vascular tortuosity with minimal to moderate narrowing of the retinal arteries (B); grade 2: grade 1 abnormalities observed as well as mild retinal hemorrhages and/or subretinal exudation (bullous retinal detachment) (C); grade 3: grade 1 and 2 abnormalities observed with partial retinal detachment and moderate/severe retinal and/or vitreous hemorrhages (D); and grade 4: grade 1 to 3 abnormalities observed as well as subtotal/total retinal detachment (E)

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Sulfonamide Toxicity

- Acute Keratoconjunctivitis Sicca
- Difficult to control tear production
- Monitor STT before and during sulfonamide administration
- Use Lacrostimlant and Lacromimetic therapy as needed

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Ivermectin Toxicity

- Blindness +/- neurologic deficits
- Mydriasis with absent or incomplete pupillary light reflex
- Ingestion
- Injection (treatment for Demodicosis)
- MDR-1 Gene Mutation
- Retinopathy with retinal edema and folds, low lying detachments, and extinguished ERG waveform amplitudes
- Blindness also caused by neurologic disease
- Blindess usually reversible
  - Supportive care
  - Chorioretinal scars remain

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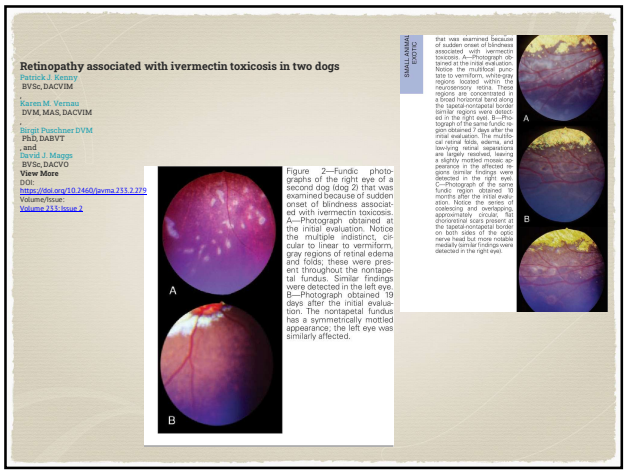
Retinopathy associated with ivermectin toxicosis in two dogs
Patrick J. Kenny
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, and
David J. Maggs
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View More
DOI:
https://doi.org/10.2460/javma.233.2.279
Volume/Issue:
Volume 233: Issue 2
SMALL ANIMAL
EXOTIC
A
B
Figure 2—Fundic photographs of the right eye of a second dog (dog 2) that was examined because of sudden onset of blindness associated with ivermectin toxicosis. A—Photograph obtained at the initial evaluation. Notice the multifocal punctate to vermiform, white-gray regions located in the tapetal fundus. Similar findings were detected in the left eye. B—Photograph obtained 19 days after the initial evaluation. The nontapetal fundus has a symmetrically mottled appearance; the left eye was similarly affected.
that was examined because of sudden onset of blindness associated with ivermectin toxicosis. A—Photograph obtained at the initial evaluation. Notice the multifocal punctate to vermiform, white-gray regions located in the tapetal fundus. Similar findings were detected in the left eye. B—Photograph of the same fundic region obtained 7 days after the initial evaluation. Notice the retinal folds, edema, and low-lying retinal separations are largely resolved, leaving a slightly mottled mosaic appearance in the affected regions (similar findings were detected in the left eye). C—Photograph of the same fundic region obtained 10 months after the initial evaluation. Notice the series of coalescing and overlapping, approximately circular, hyperreflective lesions located at the tapetal-nontapetal border on both sides of the optic nerve head but more notable medially (similar findings were detected in the right eye).

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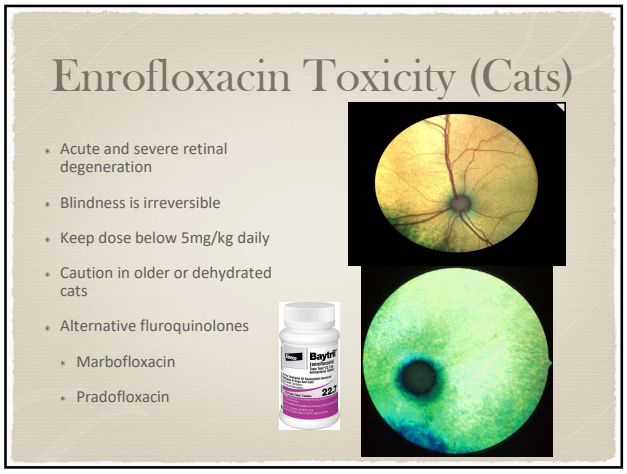
Enrofloxacin Toxicity (Cats)
Acute and severe retinal degeneration
Blindness is irreversible
Keep dose below 5mg/kg daily
Caution in older or dehydrated cats
Alternative fluroquinolones
Marbofloxacin
Pradofloxacin
Baytril

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