Ocular Manifestations of Systemic Diseases

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Veterinary Vision Evening Lecture Series

- June 10, 2014, Dr. Cook, Pediatric Ophthalmology and Genetic Eye Disease
- Oct 7, 2014, Dr. Lynch, Corneal Disease
Exam techniques

● Ocular exam
  ■ Anterior segment
    ● Adequate light
    ● Magnification
    ● Slit lamp is ideal
  ■ Posterior segment
    ● Panoptic ophthalmoscope
    ● Direct ophthalmoscope
    ● Indirect: 3d view

● General physical exam

● Laboratory tests
  ■ Blood, radiographs, other imaging, etc.
This is the view obtained with a standard ophthalmoscope.

This is the view obtained with the PanOptic™ Ophthalmoscope.
Normal fundus

- High degree of variation, particularly dogs
- Tapetum may or may not be present; if not, will see other choroidal structures
- Choroidal vessels thick and orange, retinal vessels thin and red
Categories

- **Congenital** - rare
- **Infectious** - viral, bacterial, Rickettsial, mycotic
- **Metabolic** - SARDS, diabetes
- **Hematologic** - hypertension, anemia, thrombocytopenia, coagulopathy
- **Immune** - VKH syndrome, GME, masticatory myositis
- **Neoplastic** - lymphoma, ocular mets, retrobulbar tumors, intracranial tumors
- **Toxic** - sulfa drugs, Atropine, ivermectin, Baytril, radiation therapy
- **Neurologic** - Horner’s
Infectious - signs are usually non-specific uveitis

- **Viral**
  - FIV, FCV, FeLV
  - Signs of uveitis; *FCV may have fibrin in anterior chamber*

- **Bacterial (sepsis, pyometra)**
  - Signs of uveitis

- **Rickettsial (Ehrlichia)**
  - Signs of *hemorrhage* and uveitis

- **Parasitic (Toxo)**
  - Signs of uveitis

- **Mycotic**
  - Usually signs of posterior uveitis, *crypto has typical appearance*
Infectious

● In the majority of cases, the specific signs of uveitis do not correlate with a particular organism or cause (with a few exceptions)

● Work up
  ■ Follow systemic clinical signs (cough, fever, lameness, etc.)
  ■ Regardless of clinical signs, consider chemistry and CBC to start
  ■ For cat, consider add-on FIV, FCV, FeLV, Toxoplasmosis IgG and IgM, Cryptococcosis, possibly Bartonella
  ■ For dog, consider add on Toxoplasmosis IgG and IgM, Cryptococcus, Ehrlichia, other Rickettsial diseases
Metabolic

● Sudden Acquired Retinal Degeneration Syndrome
  ■ Idiopathic
  ■ Possibly associated with Cushing’s dz
  ■ Appears to occur only in dogs
  ■ Occasionally responsive to oral steroids, but usually treatment ineffective

● Diabetes Mellitus
  ■ Causes cataracts in dogs in nearly every case
  ■ *Lens-induced uveitis not uncommon, REFER EARLY!!*
Normal Electroretinogram

ERG of dog affected with Progressive Retinal Atrophy
Hematologic

- Hypertension
  - Retinal detachment
  - Retinal and vitreal hemorrhage
  - Possible iridal hemorrhage

- Anemia

- Thrombocytopenia

- Coagulopathy
Hypertension

● Most common in cats, particularly those with renal disease

● Other possible associated diseases
  ■ Cardiac
  ■ Endocrine (diabetes, Cushing's)

● Mechanism
  ■ Exudate from choroidal vessels causes detachment
  ■ Vessel rupture cause for hemorrhage

● Treatment and diagnosis
  ■ Doppler
  ■ Amlodipine or Enalapril
Immune

- Vogt-Koyanagi-Harada Syndrome
  - Primarily Akita, other breeds
  - Immune reaction to melanotic tissues, such as uvea and skin

- Granulomatous meningoencephalitis
  - Can affect eye and cause uveitis

- Masticatory myositis
  - Can affect muscles of orbit
  - Secondary enophthalmia

- Extraocular muscle myositis
  - Typically Golden Retriever
  - Globes easy to retropulse
Neoplasia

- Orbital masses
  - Cause globe deviation, third eyelid protrusion
  - Retropulsion key in making diagnosis
  - Other causes for globe deviation, i.e. abscess

- Extra-orbital masses extending into orbit
  - Similar to orbital, but extending from periphery
  - Nasal tumors, bone and cartilage tumors

- Metastases
  - Can occur in all locations; intra-ocular, intra-orbital, extra-orbital with extension
  - Intraocular typically present with uveitis and hyphema
Toxic

- Sulfadiazine
  - Dry eye

- Topical Atropine
  - Dry eye, acute angle closure glaucoma

- Ivermecetion overdose
  - Blindness

- Baytril
  - Retinal degeneration in cats

- Radiation therapy
  - Dry eye, chronic keratoconjunctivitis, blepharitis
Neurologic

● Horner’s
  ■ Damage to sympathetic innervation
  ■ Miosis, enophthalmia, 3rd eyelid protrusion, ptosis
  ■ Most common in Golden and Lab Retriever, usually idiopathic and resolves spontaneously

● Central disease
  ■ Can affect vision without affecting eye or PLRs
  ■ Ocular exam completely normal, including ERG
  ■ Circling, seizuring, “staring”, etc.
  ■ Cataract patients
Horner’s - localization

- Pre-ganglionic vs. post-ganglionic
- Pre sites
  - include brain, cervical spine, thorax, vagosympathetic trunk, otitis
- Cranial cervical ganglion
  - located near tympanic bullae
- Post sites
  - include ear, brain, orbit, and eye
- Pharmacologic localization
  - Relies on neurotransmitters located along the nerve chain
Horner’s - localization

- The vast majority are post-ganglionic and idiopathic
- Damage to post-ganglionic nerve causes depletion of neurotransmitter (norepinephrine) at iridal motor endplate
- Iridal muscle then becomes super sensitive
- Instill 2.5% Phenylephrine OU
- If abnormal pupil dilates within 10 minutes, post-ganglionic lesion confirmed
- Effect of phenylephrine temporary
The End