Ocular Manifestations of Systemic Endocrine, Metabolic, and Hematologic Disorders in Dogs and Cats

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Learning Objectives

1. To understand the different ocular manifestations associated with the following clinicopathologic abnormalities: hyperglycemia, hypocalcemia, hyperlipidemia, and hyperbilirubinemia
2. To be familiar with systemic vascular and hematologic disorders that can produce ocular manifestations

Outline

1) General Concepts
2) Endocrine/Metabolic diseases
    a. Hyperglycemia
    b. Hypocalcemia
    c. Hyperlipidemia
    d. Hyperbilirubinemia
    e. Lysosomal storage diseases
3) Vascular/Hematologic diseases
    a. Bleeding disorders
    b. Polycythemia/hyperviscosity
    c. Anemia

1) General Concepts

The ocular examination is a valuable diagnostic tool for a wide-range of systemic disorders and it is frequently underused by clinicians for this purpose. Performance of a complete ocular exam requires relatively simple and inexpensive equipment.

Ocular lesions are frequently observed with systemic disease. Examination of the eyes provides the unique opportunity for direct visual examination of the nervous (optic nerve) and vascular (retinal and uveal vessels) systems of the animal. Animals with systemic disease conditions are often first presented for evaluation of their ocular problems as these lesions may be visually obvious to owners and clinical signs of ocular disease are often more readily apparent, and difficult to ignore, than subtle systemic abnormalities.

2) Metabolic/Endocrine Disease

Diabetes mellitus is a common etiology of cataracts in the dog and a rare etiology in the cat. Diabetic retinopathy (characterized by retinal microaneurysms and hemorrhages) may also develop with chronicity, but is generally not vision-threatening in companion animals. Sustained hypocalcaemia results in cataracts that appear as focal, punctate to linear, lens opacities that begin in the posterior cortex and clinically resemble snowflakes.

Hyperlipidemia may result in lipid keratopathy, lipemic uveitis, lipemic iridal vessels, or lipemia retinalis. The sclera is a classic location for the detection of subtle icterus/jaundice and intraocular structures may also be affected by this color change.

3) Vascular/Hematologic Disease

Thrombocytopenia and coagulopathies may be associated with periocular or intraocular hemorrhage. With serum hyperviscosity and polycythemia, dilated and tortuous conjunctival and retinal vessels, retinal hemorrhages, retinal detachment, and papilledema may develop.

Severe anemia is associated with pale retinal vessels, retinal hemorrhages, and conjunctival pallor. These changes are typically not seen until the hematocrit approaches 5-7% or lower.