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THE RED EYE PRESENTATION
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INTRODUCTION

A red appearance to the “white” of the eye (i.e. the sclera, overlying episclera or bulbar conjunctiva) is a common presenting sign in veterinary ophthalmology. It may be due to active hyperemia, vascular engorgement, or hemorrhage affecting the bulbar conjunctiva, episclera or sclera. The “red eye” presentation may be associated with several distinct clinical entities the seriousness and management of which differs considerably.

Differential Diagnosis of a Red Eye

<table>
<thead>
<tr>
<th>Due to local disease:</th>
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<tbody>
<tr>
<td>conjunctivitis</td>
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<tr>
<td>conjunctival hemorrhage</td>
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<tr>
<td>associated with corneal damage or ulceration</td>
</tr>
<tr>
<td>episcleritis</td>
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<tr>
<td>scleritis</td>
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<tr>
<th>Secondary to intraocular disease:</th>
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<tr>
<td>anterior uveitis</td>
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<tr>
<td>glaucoma</td>
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<th>Secondary to conditions other than intraocular disease:</th>
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<tr>
<td>orbital disease</td>
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<tr>
<td>Horner’s syndrome</td>
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<tr>
<td>hemorrhage associated with coagulopathy</td>
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INVESTIGATION OF THE RED EYE

Every animal that presents with a red eye requires a full ophthalmic examination. It is important to differentiate between conjunctival hyperemia and episcleral congestion/injection. The latter differentiation is important because congestion or injection of the episcleral vasculature is indicative of intraocular disease such as anterior uveitis (inflammation of the iris and ciliary body) or glaucoma (increased pressure within the eye). The treatment and prognosis of conjunctivitis, uveitis and glaucoma are quite different. Hyperemia of the conjunctiva (e.g. in conjunctivitis) results in a diffuse reddening which is greatest in the fornix, the vessels involved are small diameter and can be seen to move if the conjunctiva is moved, additionally they blanch readily if topical phenyephrine is applied. In contrast, episcleral vessels are straighter, overlie the globe and have a deeper red color, and because of their position the conjunctiva can be moved over them.
♦ It is wise to check the tear production of any dog that presents with conjunctival hyperemia, unless there is an obvious excessive tear production.
♦ An eye with conjunctival hyperemia and some evidence of irritation or discomfort should be stained with fluorescein to check the integrity of the corneal epithelium.

SPECIFIC CAUSES OF A RED EYE

Conjunctivitis
Conjunctivitis is a common cause of a red eye. It is a condition that has many possible etiologies including infection, reduced tear production, foreign body, trauma and allergy. Many cases are self-limiting once any predisposing factor is identified and treated.

Canine Conjunctivitis
Most commonly secondary to other abnormalities such as lid disease, trauma, foreign bodies and tear film abnormalities. Primary infectious conjunctivitis is rare. An allergic conjunctivitis is sometimes seen in dogs with atopy.

Follicular conjunctivitis
This is a nonspecific response to unknown antigens that is commonest in young dogs. Follicles appear as semitransparent pink raised lesions. The condition may respond to topical steroids; if not debriding the follicles may be required.

Plasma cell infiltration of nictitans
Most commonly seen in German shepherds often associated with pannus (chronic superficial keratitis). The free border of the nictitans is depigmented and often a purple-pink color and has a thickened "cobblestone" appearance. Not associated with irritation but a mucoid discharge may be present. Like pannus is believed to be immune-mediated. Suppress with topical steroids and/or cyclosporin. Reduce UV light exposure.

Feline Conjunctivitis
Unlike dog most cases are due to infectious causes:

Chlamydophila felis conjunctivitis
Often a problem in colonies or multicat households. It usually starts unilaterally but becomes bilateral. The discharge is serous but becomes purulent with chronicity. There is marked chemosis but no corneal involvement (compare herpes). Diagnosis is by conjunctival cytology, PCR assay, fluorescent antibody test, culture. Treatment: with tetracyclines. Topically (e.g. Terramycin) and systemically e.g. doxycyline 5-10mg/kg q12hr PO. Vaccine available.

Feline Herpesvirus Infection
Common cause of ocular surface disease in the cat causing neonatal conjunctivitis and conjunctival/corneal/respiratory infection in young cats/kittens. Recrudescence of latent infection causes a variety of ocular surface problems in adult cats. There is possibly an association with corneal sequestrum and perhaps eosinophilic keratoconjunctivitis. Stromal keratitis may develop in immunocompromised cats. Diagnosis is by clinical signs, scrapings for fluorescent antibody test, PCR assay, virus isolation.
Treatment:
Antivirals: trifluorothymidine, idoxuridine
L-lysine oral 250-500mg/day/cat
? recombinant α-interferon orally & topically - no proof of efficacy.

Episcleritis
Inflammation of the episclera is likely to be an immune-mediated condition. The lesions may be nodular or more diffuse and have a pinkish proliferative or “fleshy” appearance. The adjacent cornea and overlying conjunctiva are usually also involved. Although episcleritis is rare it has a fairly characteristic appearance and is not difficult to diagnose.

Conjunctival hemorrhage
This has a characteristic appearance and may result from trauma, strangulation and systemic disorders resulting in coagulopathies.

Red Eye resulting from Orbital Disease
Retrobulbar infections (cellulitis and abscesses) result in inflammation and swelling of the conjunctiva in addition to an exophthalmos. The forward protrusion of the globe and resistance to repulsion into the orbit make the diagnosis straightforward in most cases.
Retrobulbar tumours are also a cause of exophthalmos and, due to impairment of venous return, there may also be conjunctival hyperemia.

Anterior Uveitis
This is a potential sight threatening disorder. Intraocular inflammation may result from many different causes and is sight threatening. Prompt recognition, investigation and treatment are required for successful management.

Signs of anterior uveitis

Acute
♦ pain
♦ red eye – episcleral injection / ciliary flush
♦ corneal edema
♦ corneal vascularization starting as a deep “brush-border” pattern
♦ keratitic precipitates
♦ hypopyon
♦ hyphema
♦ iris swelling
♦ iris vascular engorgement, visible if iris is light in color
♦ miotic pupil

Chronic
As for acute but also:
♦ more extensive corneal vascularization
♦ iris neovascularization
♦ pre-iridal fibrovascular membrane
♦ synechiation (iris to lens synechiae)
• iris bombé
• secondary glaucoma
• iris pigment change (most cases darkened)
• iris thickening
• secondary lens changes (cataract, lens luxation)

**Etiology of uveitis**

• immune mediated
• infectious
  ◆ dog – bacterial, fungal, algal, viral (CAVI)
  ◆ cat – FIP, FIV, FeLV, toxoplasma, fungal, bacterial
• toxic e.g. pyometra
• trauma – blunt, sharp/penetrating
• lens induced uveitis (phacolytic secondary to leakage from hypermature cataract; phacogenic from lens capsule rupture)
• associated with intraocular neoplasia

**Treatment for uveitis**

Treat underlying cause directly if possible, otherwise treat symptomatically with the following (unless contraindicated):

• antiinflammatories. Topical and if required systemic, NSAIDs and corticosteroids (rule out fungal infection before starting steroids)
• atropine. Aim to achieve a mid-dilated pupil

**Acute Glaucoma**

Acute rises in intraocular pressure are sight threatening. Glaucoma may occur secondary to other intraocular diseases (such as anterior lens luxation and anterior uveitis) or may occur (in dogs at least) as a primary condition. Acute angle closure glaucoma carries a poor prognosis for vision and is a cause of severe discomfort to the affected animal.

The following table will help to differentiate between conjunctivitis, acute anterior uveitis and acute glaucoma:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Conjunctivitis</th>
<th>Anterior uveitis</th>
<th>Acute Glaucoma</th>
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<tbody>
<tr>
<td>Pain</td>
<td>mild irritation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vision</td>
<td>unaffected</td>
<td>May be reduced</td>
<td>Severely affected</td>
</tr>
<tr>
<td>Ocular discharge</td>
<td>Serous, mucoid or mucopurulent</td>
<td>Slight discharge</td>
<td>Slight discharge</td>
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<tr>
<td>Conjunctival &amp; episcleral vessel appearance</td>
<td>Generalized conjunctival hyperemia</td>
<td>Episceral injection, + often some conjunctival hyperemia</td>
<td>Conjunctival and episcleral congestion</td>
</tr>
<tr>
<td>Cornea</td>
<td>Unaffected</td>
<td>May be some opacity</td>
<td>Usually corneal edema</td>
</tr>
<tr>
<td>Intraocular changes</td>
<td>None</td>
<td>Inflammatory material in anterior chamber, pupillary constriction, iris involvement, lens and posterior segment</td>
<td>Typically a dilated non-responsive pupil, may have a luxated lens, posterior segment involvement</td>
</tr>
<tr>
<td>may also be affected</td>
<td></td>
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