The Red EYE

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Ophthalmology
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The Red Eye

The red appearance to the eye may be the first indication to the owner that there may be a problem with their pet’s eye.

The red eye is a common clinical sign that is a manifestation of one to several combinations of a variety of ocular disorders, many times associated with systemic disorders rather than just the eye alone. Even though many ocular disorders result in a red eye, knowing a list of the causes for a red eye will empower the clinician and allow for a systematic sorting of the list to arrive at a tentative diagnosis. The causes for a red eye in some cases are fairly specific but in others less so which requires the clinician to further investigate the patient. For example, Cherry Eye being specific and Uveitis which will require the clinician to determine if exogenous or endogenous and if the latter, a complete physical examination and uveitis workup.

The following list of causes for a red eye is based on the outward or external appearance of the eye(s).
Causes for RED EYE

- Blepharitis
- Cherry Eye
- Conjunctivitis
- Corneal Hemorrhage
- Episcleritis
- Glaucoma
- Hyphema
- Iris Hemorrhage
- Intraocular Neoplasia
- Keratitis
- Subconjunctival Hemorrhage
- Uveitis

The following pages contain images that represent some examples of each cause listed above followed by a page of Distinguishing Characteristics and Differerentials as well as an occasional list of Key Elements when necessary.
Blepharitis

Herpes Blepharitis

Mycotic Blepharitis (*Microsporum canis*)
Feline Dermatophytosis

Traumatic

Pyoderma associated Blepharitis

*The Red EYE*
Distinguishing Characteristics

- Red Eye
- Swollen eyelids
- Reddened eyelids
- Scale or crust on eyelids
- Scabs or open sores on eyelids
- Abnormal ocular discharge
- Often associated with Pyoderma and or Otitis

Differentials

1. Infection
   - Bacterial
     - Often times secondary to Pyoderma
     - Foreign body
   - Mycotic
   - Viral
   - Parasitic
   - Neoplasia
   - Allergy
   - Trauma

The Red EYE - Blepharitis
Cherry Eye

Scrolled Cartilage of Third Eyelid Masquerading as Cherry Eye

The Red EYE
Distinguishing Characteristics

- Red mass projecting from behind the third eyelid in a young dog or cat (uncommon in cats)
- Painless - animal may paw at eye initially (could be due to partial vision blockage by gland)
- Acute onset
- Initially an abnormal discharge that may or may not persist
- Reducible but usually temporary
- Breed predispositions

NOTE: Current thought is that the ligamentous attachment of the gland to the deep orbital tissue which holds the gland in place is poorly developed in those affected animals and due to the weakness breaks early in life resulting in the prolapse and explaining the breed predisposition.

Differentials

- Prolapsed gland can occur secondary to increased orbital contents: orbital edema, hemorrhage, abscess or tumor.
- Scrolled Cartilage of the third eye lid can masquerade as a Cherry Eye (not uncommon to have both scrolled cartilage and Cherry Eye at the same time)
- Abscessed gland of the third eyelid after cat claw or other trauma
- Tumor (adenoma or adenocarcinoma) rare. Adenoca’s are very aggressive!

The Red EYE - Cherry Eye
Conjunctivitis

Feline URI

KCS

The Red EYE
**Distinguishing Characteristics**

- Red Eye (mostly superficial - conjunctival)
- Abnormal ocular discharge (purulent, mucopurulent, mucoid, seromucoid)
- Blepharospasms (variable)
- Chemosis (variable)

**Key Elements**

- Commonly secondary to another primary condition in the animal (local foreign body, eyelid abnormality, etc. see 2 - 3 below).
- Commonly associated with dermatologic, allergic, otic or tear film deficiencies in Dogs.
- Commonly associated with Upper Respiratory Infections in Cats.

**Differentials**

- Each species has its own list of differentials
- Look first for a local or systemic cause (see Key Elements)
- Most common misdiagnosis for Red Eye! Notice there are actually 11 other potential causes for Red Eye other than conjunctivitis!
Corneal Hemorrhage

Photo by Dr. Andras Komaromy, DVM DACVO
Distinguishing Characteristics

- Red area in the cornea that is either opaque or translucent
- Always associated with corneal blood vessels
- Deep or superficial

Key Elements

1. Rupture of corneal blood vessels with extravasation of blood between the corneal stromal collagen fibers.
2. Preexisting corneal blood vessels are required and not associated directly with the extravasation of blood (ie: some other cause for leakage of blood).

Differentials

- Consider all normal differentials for hemorrhage (ie: coagulopathy, etc.)
- Especially consider hypertension
- Senile fragility of blood vessels (idiopathic cause is most common)
- Cushings Disease (fragile blood vessels)

The Red EYE - Corneal Hemorrhage
Episcleritis

The Red EYE
Distinguishing Characteristics

- Red Eye
- Focal (nodular) or diffuse (encircling) perilimbal subconjunctival firm swelling ridge of swelling.
- Over time the subconjunctival lesion will extend across the limbus and into the cornea manifesting as corneal edema and ciliary flush.
- Some patients with also have a mild anterior uveitis characterized by an aqueous flare and or cells as well as a low intraocular pressure (<10 or 12 mm Hg).

Differentials

- Foreign body granuloma
- Staphyloma
- Traumatic scleritis
- Keratoconjunctivitis
- Uveitis
- Neoplasia

*The Red EYE - Episcleritis*
Glaucoma

Chronic Glaucoma with Buphthalmia

The Pictures above and below were taken by PE. Miller, DVM DACVO

Anterior Lens Luxation and Secondary Glaucoma

Acute Glaucoma

The Red EYE
Distinguishing Characteristics

- Increased IOP (intraocular pressure) always present
- Red Eye (deep vascular congestion - episcleral)
- Serous ocular discharge
- Corneal Edema (variable)
- Dilated Pupil (variable)
- Vision impairment (variable)
- Enlarged globe (end-stage)

Differentials

Glaucoma is a “clinical sign” with many causes for abnormal elevation of IOP, here are some of the causes:

- Primary or Breed Associated
- Uveitis
- Trauma
- Lens Luxation
- Neoplasia
Hyphema

Resorbing clotted (hyphema) now fibrin and blood

Corneal perforation

iris prolapse

Hyphema

Clot

The Red EYE
Distinguishing Characteristics

1. Blood in the anterior chamber
2. Blood can be in the form of:
   • Whole Blood partially or totally filling anterior chamber.
     o Occupies inferior anterior chamber and as volume increases the level will rise.
   • Blood Clot - varies in size and shape and may be adherent to iris/cornea/lens
   • Translucent or hemolized blood
   • Diagnosed with slit light to localize position in anterior chamber.

Differentials

• Consider all the differentials that you would for hemorrhage anywhere else.
• Always consider Hypertension - it is very easy to take a blood pressure.
• In addition to the common differentials for hemorrhage elsewhere.
  • Uveitis
  • Retinal Detachment
  • Intraocular neoplasia

The Red EYE - Hyphema
Distinguishing Characteristics

- Hemorrhage in the body of the iris
- Very uncommon
- Seen more readily in blue or light colored irides
- Flame or blotchy red patch in iris

Some Causes of Hemorrhage to Consider

<table>
<thead>
<tr>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
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<tr>
<td>Coagulopathy</td>
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<tr>
<td>Hemolysis</td>
</tr>
<tr>
<td>Toxins (drugs included)</td>
</tr>
<tr>
<td>Hypertension</td>
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<td>Neoplasia</td>
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<tr>
<td>Ectoparasites (ticks - transmission of diseases that can cause hemorrhage)</td>
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<tr>
<td>Choking</td>
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</tbody>
</table>

Differentials

Consider all the differentials that you would for hemorrhage occurring anywhere else in the body.
Always consider Hypertension - it is very easy to take a blood pressure.
Intraocular Neoplasia

Ciliary Body Adenocarcinoma

Lymphoma

The Red EYE
Distinguishing Characteristics

- Red Eye
- Intraocular opacity/mass visible in the anterior chamber and or at the pupil
- Irregular in shape
- May distort iris contour
- Slit light examination with magnification is essential to localize mass

Differentials

- Ciliary Body Tumor (adenoma vs. adenocarcinoma [pinkish white])
- Melanoma (pigmented except for amelanotic melanomas)
- Lymphoma (white to pink-white)
- Metastatic tumor of many other types (various colors)
- Granuloma (parasitic, fungal, foreign body)

The Red EYE - Intraocular Neoplasia

K-9 Toxoplasma granuloma
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Punctate Keratitis</td>
</tr>
<tr>
<td>B</td>
<td>Non-Healing Corneal Ulcer with Pigmentary Keratitis</td>
</tr>
<tr>
<td>C</td>
<td>Healing Corneal Ulcer Secondary to Previous Corneal Foreign Body</td>
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<tr>
<td>D</td>
<td>Degenerative Pannus</td>
</tr>
<tr>
<td>E</td>
<td>Eosinophilic Keratitis</td>
</tr>
<tr>
<td>F</td>
<td>Pigmentary Keratitis secondary to Trichiasis from Medial Lower Lid Entropion</td>
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The Red EYE
Distinguishing Characteristics

- Red Eye
- Vascularization of cornea (superficial or deep) variable
- Corneal Edema (variable)
- Corneal Pigmentation (variable)
- Corneal Scarring (variable)
- Corneal erosion or ulcer (variable) [keratitis can be ulcerative or nonulcerative]
- Corneal Mineral Deposits (variable)

Differentials

1. Primary or secondary corneal inflammation (a few examples below - there are many more)
   - Primary
     - Degenerative Pannus
     - Superficial Punctate Keratitis
   - Secondary
     - Trauma (frictional)
     - KCS
     - Exposure
     - Infection (bacterial, viral, mycotic)

The Red EYE - Keratitis
Subconjunctival Hemorrhage

Traumatic Proptosis

Hemolytic Anemia

The Red EYE
Distinguishing Characteristics

- Red Eye
- Focal or diffuse hemorrhage with and/or below the conjunctiva
- Lesions flat or raised

Differentials

Always consider **Hypertension** - it is very easy to take a blood pressure.
- In addition to the common differentials for hemorrhage elsewhere:
  - Choking (over looked many times - need a good history!)

Consider all the differentials that you would for hemorrhage anywhere else in the body

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Uveitis

Endogenous Idiopathic Uveitis

Toxoplasmosis

Idiopathic Iritis

FIP

The Red EYE

Idiopathic Iritis

LIU
Distinguishing Characteristics

• Red Eye (deep and superficial hyperemia)
• Serous ocular discharge
• Pain (blepharospasms, photophobia, pawing at eye) variable
• Prolapse of third eyelid (variable)
• Corneal edema (variable)
• Aqueous flare (variable degree of severity 1 - 4 grade)
• Cells in the anterior chamber (variable amount)
• Miosis (variable)
• Hypopyon (variable)
• Iritis (visible iris swelling - loss of contour and detail of iris)
• Muting of iris color and darkening over time
• Hyperemia of iris (extreme = rubeosis irides)
• Hypotony (decreased IOP - intraocular pressure)
• Ciliary Flush
• Synechia
• Keratic ppt.

Differentials

1. Exogenous Causes
   • Trauma
   • Keratitis
2. Endogenous Causes

The Red EYE - Uveitis
Summary

Many ocular disorders include the clinical sign a Red EYE!

Knowing the most common possible causes for a red eye as well as the distinguishing characteristics and the differential diagnoses for each, will assist you with making a accurate clinical diagnosis.