

OCULAR EMERGENCIES

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Required Reading: This handout

Suggested Reading: *Ocular Emergencies* in Slatter's Fundamentals of Veterinary Ophthalmology, 4th ed by David J. Maggs, Paul E. Miller and Ron Ofri

OBJECTIVES:

1. To be able to recognize and suggest the initial treatment for a true ophthalmic emergency.
2. To be able to suggest appropriate diagnostic methods that can be used in an ocular emergency.
3. To be able to identify the general goals of emergency therapy and to be able to suggest specific ways of meeting those goals.

I. General Considerations:

- A. Ophthalmic Emergencies** - Require immediate professional attention to maintain vision, the integrity of the globe, or to relieve ocular pain.
1. Any animal exhibiting acute ocular pain, deformity of the globe or orbit, acute loss of vision or a sudden change in appearance of the eye should be treated as an emergency until proven otherwise.
 2. Accurate history and complete physical exam are essential.
- B. Other Systems** - The maintenance of pulmonary, cardiovascular, hemodynamic and neurologic functions takes precedence over vision in emergency situations. These systems must be stable before definitive ocular therapy can be carried out.

II. ORBIT - Many acute orbital disorders are true emergencies.

A. General Goals of Orbital Emergencies

1. Ensure other body systems are stable prior to instituting definitive orbital therapy.
2. Quickly restore the protective role of the orbit.
3. Maintain ocular neurologic and adnexal function.
4. Protect the cornea from drying and ulceration.

5. Address any uveitis or optic neuritis.

6. Do no harm.

B. Orbital Fractures - Horse and dog most common. Evaluate neurological status and patency of nasolacrimal system as well as eye for corneal ulcers, uveitis or entrapment of the globe by retrobulbar bone fragments. Physical examination usually of greater value than radiographs. Best cosmetic results achieved by early surgical elevation, +/- systemic antibiotics and appropriate ocular therapy. Good prognosis if no concurrent injuries.

C. Orbital Abscess/Cellulitis - Orbital swelling - exophthalmia - pain on opening mouth. Look for an orbital foreign body. Treat with systemic antibiotics and surgical drainage per os just caudal to last molar. Cytology may help in Dx. If exposure keratitis is present, may need topical lubricants or temporary tarsorrhaphy.

D. Proptosis - Usually secondary to trauma (HBC, bite wounds). More common in breeds with prominent eyes, shallow orbits and wide palpebral fissures as these breeds require less trauma to produce proptosis. A much greater force (and hence a poorer prognosis) is required to proptose the globe in breeds with deep set eyes, in cats, or species with complete bony orbits (i.e., cattle, horses). Once the globe is displaced forward, the lids contract behind it, mechanically constricting venous return. This produces adnexal swelling which, in addition to the swelling and hemorrhage due to the primary injury, prevents the eye from returning to the orbit. Favorable prognostic indicators include: brachycephalic dog, positive direct or consensual pupillary light response, normal findings on posterior segment exam, and a proptosed eye with vision on initial presentation. Unfavorable indicators include: non-brachycephalic breed of dog, any cat breed, hyphema, no visible pupil, facial fractures, optic nerve damage and avulsion of 3 or more extraocular muscles.

1. **Treatment** - See Slatter pp 419-421.

2. **Enucleate** - If only conjunctival attachments remain and/or optic nerve obviously severed, globe is ruptured or can't be replaced. When in doubt replace the globe -- it can always be removed later.

III. ADNEXA - Many acute adnexal lesions are more of an urgent case requiring attention within the next few hours to day, rather than an emergency requiring immediate attention. Adnexal lesions should be seen that day, as they may also involve the globe.

A. General Goals of Therapy for Adnexal Emergencies.

1. Ensure the globe is not also injured.

2. Quickly restore the protective, lubricant, and tear film spreading functions of the adnexa.

3. Minimal debridement with very accurate tissue apposition.
4. Do no harm.

B. Eyelids

1. **Blunt trauma** - so called "Black Eye" - rule out intraocular injuries and treat with cool compresses and possibly with topical and/or systemic antibiotic/steroids.
2. **Sharp trauma** - Lid lacerations.
3. **Allergic reaction** - a local reaction to insect bite/sting or a generalized allergic reaction. Usually respond within 24 hours to systemic antiinflammatories or antihistamines. Is an emergency only if respiration is impaired.

C. Conjunctiva

1. **Subconjunctival hemorrhage** - Common. Usually are traumatic but can be due to bleeding disorders, septicemia, or over-restraint. Often resolves without treatment in 10-14 days.

IV. GLOBE

A. Anterior segment- Acute conditions are often true emergencies.

1. Cornea

a. Goals of Emergency Therapy for the Cornea.

- 1) Quickly arrive at an accurate diagnosis as to the depth and severity of the lesion.
- 2) Ensure mechanical integrity of the cornea.
- 3) Collect the appropriate samples prior to therapy and prevent sepsis.
- 4) Control intraocular pain and inflammation.
- 5) Do no harm, i.e. no steroids with ulcers etc.
- 6) If these goals can't be achieved and vision or the integrity of the globe is threatened - refer now.

- b. Chemical keratitis** - Alkaline more destructive than acids. Treat with immediate copious lavage for as long as the animal will allow (up to 30 minutes). Nothing,

including transportation to you should delay irrigation.

- c. **Erosions/ulcerations** - Very common. Always try to identify an etiology. See Cornea lecture.
 - 1) **Superficial erosions** - Urgent cases not emergencies. A soft contact lens or third eyelid flap may provide some pain relief. Debridement is essential.
 - 2) **Ulcerations** - More serious. Cytology very helpful in initial management. In melting ulcers consider *Pseudomonas* and treat aggressively with antibiotic/ anticollagenases. Gentamicin is a good initial choice. If deeper than 2/3 of cornea perform a conjunctival (not 3rd lid) flap.
- d. **Corneal Laceration** - If $> 2/3$ corneal thickness surgically close with 6-0 to 9-0 suture material. Avoid ointments as the petrolatum base in the anterior chamber can cause a severe anterior uveitis. Always be concerned about lens capsule perforation with the potential for chronic lens-induced uveitis or traumatic cataract.
- e. **Corneal Foreign Bodies** - Plant most common. Examine under general anesthesia so you have control of the situation. Often tears moisten the FB and fragment it. Be prepared to suture the cornea following removal.

2. Anterior Uvea

a. Goals of emergency therapy for anterior uveal disorders:

- 1) Arrive at an accurate diagnosis rapidly i.e. anterior uveitis, glaucoma, lens luxation etc.
- 2) Control intraocular pain and inflammation.
- 3) Prevent undesirable sequela (synechia, secondary glaucoma etc).
- 4) Collect diagnostic samples prior to therapy.
- 5) Do no harm. For example, do not put a dog with blastomycosis-induced anterior uveitis onto immunosuppressive doses of corticosteroids.
- 6) If you can't arrive at a diagnosis and vision is threatened or impaired its time to recommend referral.

- b. **Penetrating ocular foreign bodies** - Gunshot and plants most common. Therapy is dictated by composition of the foreign material, its position, the degree of inflammation, and the availability of ophthalmic specialists (a specialist is needed to remove intra-ocular FBs). Plant material has a high rate of infection (bacterial or fungal).

Gunshot pellets are usually best left alone as these rarely get infected. Explore gunshot wounds only if globe integrity is in question, there is heavy wound contamination or persistent bleeding. Radiographs with a metal ring outlining the limbus may help determine the pellet's position and extent of ocular injury.

- c. **Hyphema** - Etiologies include trauma, bleeding disorders, chronic iridocyclitis, intraocular neoplasia, congenital ocular anomalies. If a patient has intraocular hemorrhage and glaucoma suspect neoplasia.

1) Therapy - Monitor IOP and control coexisting uveitis.

- a) Pilocarpine may hasten resorption out the angle but may lead to synechiation or worsen uveitis.
- b) Atropine may prevent synechia but may lead to glaucoma and prolonged absorption.
- c) Surgical removal is rarely indicated.

d. **Acute Anterior Uveitis** - See uveitis lecture.

1) Therapy - Uncontrolled inflammation rapidly destroys the globe, therefore, aggressive medical therapy should be instituted without delay.

- a) Topical and systemic steroids are usually required but be careful of blastomycosis in Wisconsin. Deep fungal infections usually have posterior segment disease as well. If the posterior segment is normal, systemic steroids may be used with more confidence. Antiprostaglandins may be an alternative to steroids pending laboratory results.

e. **Anterior Lens Luxation** - See lens lecture. Refer to a specialist if possible.

f. **Acute Glaucoma** - A true emergency. See Glaucoma lecture. Acute glaucoma usually occurs in the dog. In cats or horses it is usually secondary to severe uveitis and heroic therapy may not be warranted or practical. May need referral for cryosurgery/gonioimplant in the 1st 24-48 hrs.

B. Posterior Segment - Treat all "acute" losses of vision as a potential emergency. Pain and externally visible inflammation generally are not a feature of these conditions.

1. **Goals of emergency therapy for posterior segment disorder:**

- a. Get an etiologic diagnosis quickly and prior to therapy.

- b. Preserve the function of the retina and optic nerve.
 - c. Do no harm i.e. avoid steroids in infectious disease and toxic drugs in diseases which have no therapy ex. PRA.
 - d. If these goals can't be reached and vision is threatened or impaired its time to recommend referral.
2. **Optic neuritis** - A true emergency presenting as sudden, often bilateral blindness. A normal ERG differentiates it from SARDS. Numerous etiologies. The optic nerve head may look normal or abnormal. Rx (watch out for deep fungals):
- a. Systemic corticosteroids (taper over 3-4 weeks).
 - b. Systemic chloramphenicol.
3. **Retinal detachment** - May or may not be true emergency as some cases are chronic. Photoreceptors begin to degenerate in 1-3 days. Is often a penlight diagnosis. As numerous etiologies are possible, aspiration of subretinal fluid may help diagnostically. Before steroids are used to reduce subretinal fluid accumulation, however, infectious etiologies (especially the deep fungals) must be ruled out. Occasionally diuretics (furosemide and one dose of mannitol) have been used in addition to systemic prednisone to facilitate subretinal fluid resorption.
4. **Sudden Acquired Retinal Degeneration Syndrome** - (SARDS, metabolic toxic retinopathy). Clinically resembles optic neuritis with sudden blindness but an abnormal ERG distinguishes it from optic neuritis. A normal appearing fundus differentiates it from PRA. Usually have a history of polyuria, polydypsia and weight gain. They have a normal life span but never regain vision.
5. **Progressive Retinal Atrophy** - may be confused with a true emergency if the environment has recently changed and the animal now bumps into objects.