

Management of Ocular Trauma

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Abstract

Ocular trauma can manifest in a variety of ways, ranging from simple to complex. Appropriately triaging a canine patient with acute ocular trauma is crucial for establishing an accurate diagnosis, determining the prognosis for the eye, crafting a treatment plan, and using this information to guide clients in the care of their pet. This lecture will equip the clinician for this task and, thereby, build their confidence in the management of traumatic orbital, eyelid, conjunctival and corneal conditions. Penetrating intraocular trauma and stabilization methods prior to referral will also be briefly discussed.

1. General Approach to the Examination of an Ocular Trauma Patient
 - a. Careful restraint +/- sedation
 - b. Topical analgesia – proparacaine, tetracaine
 - c. Thorough physical examination and ocular examination
 - d. Assess for vision – menace response, dazzle reflex, direct and CONSENSUAL pupillary light reflexes
 - e. Tonometry, if safe
 - f. Fluorescein stain
 - g. Consider referral, if necessary
2. Orbital Disease
 - a. Fractures
 - i. Clinical signs may include facial asymmetry, crepitus, strabismus, proptosis, lagophthalmos, exophthalmos, enophthalmos, hematoma, skin lacerations, pain
 - ii. Diagnostics include thorough physical examination, skull imaging (radiographs acceptable, but advanced imaging is preferred)
 - iii. Treat by stabilizing patient, supportive care (lubrication), systemic control of inflammation, and management of secondary ocular abnormalities noted on exam. Small non-displaced fractures do not typically need surgery, but larger, unstable, or displaced fractures do. Prognosis depends on the degree of ocular involvement.
 - b. Proptosis – the sudden, forward displacement of the globe with simultaneous entrapment of the eyelids behind the equator
 - i. Clinical signs include strabismus, subconjunctival hemorrhage, ocular surface trauma and desiccation, blindness, etc.
 - ii. Establish the prognosis based on clinical signs in order to determine best treatment option
 1. Favorable prognosis – brachycephalic dog, positive PLR, vision
 - a. Treatment: repositioning of eye into orbit and placement of partial temporary tarsorrhaphy
 2. Poor prognosis – non-brachycephalic dog, cat, hyphema, facial fractures, optic nerve damage, avulsion of 3 or more extraocular muscles
 - a. Treatment: enucleation
 - iii. Sequelae – neurotrophic KCS, corneal ulceration, strabismus (more often lateral), blindness, phthisis bulbi
3. Eyelid Disease
 - a. Lacerations – a surgical condition! If surgery is not performed, cicatrix may form. This may result in eyelid margin distortion and loss of function that will lead to keratitis and other ocular surface complications.
 - i. Flush the affected area, debride but do NOT excise the wound edges, and then close in two layers – subcutaneous horizontal mattress sutures (5-0 to 6-0 absorbable material), followed by a figure-of-eight suture at the eyelid margin (5-0 to 6-0 non-absorbable material), and lastly skin sutures (5-0 to 6-0 non-absorbable material) in a simple interrupted pattern.

- ii. Topical antibiotic ointment, oral antibiotics, and oral anti-inflammatory medications indicated
 - iii. Refer if greater than 1/3 of the lid margin is affected - requires reconstructive blepharoplasty
- 4. Conjunctival Disease
 - a. Subconjunctival Hemorrhage
 - i. Usually secondary to trauma and does not require specific treatment
 - ii. May be secondary to bleeding disorders too
 - b. Conjunctival Lacerations
 - i. Conjunctiva is a highly vascular tissue that rarely needs surgical repair when lacerated. Typically heals by second intention with topical antibiotic ointment and steroid combination.
 - ii. Be sure to evaluate for penetrating intraocular trauma (scleral rupture) and for the presence of foreign bodies.
 - c. Third Eyelid Foreign Body
 - i. ALWAYS look behind/posterior to the third eyelid when signs of severe blepharospasm, mucoid discharge, and conjunctival hyperemia are present. A foreign body may also cause conjunctival follicle prominence and corneal ulceration.
 - ii. Treat by removing the object under topical anesthesia, followed by a topical antibiotic +/- a topical steroid if the corneal is not ulcerated. A systemic NSAID is helpful for pain and inflammation as well.
- 5. Corneal Disease
 - a. Chemical Burn
 - i. Clinical signs – acute blepharospasm, severe corneal edema (alkaline > acid), superficial or stromal corneal ulceration
 - 1. Acids – limited penetration -> non-progressive superficial ulcer
 - 2. Alkalis – saponify fats and cause lipolysis and proteolysis -> deep, progressive corneal ulcer. Also, can damage corneal endothelium leading to corneal edema.
 - ii. Treat with copious lavage for 15-30 minutes, topical antibiotic, serum, and systemic NSAID
 - b. Corneal Laceration
 - i. If less than 50% depth, treat as a stromal ulcer with topical antibiotic, atropine, and a systemic NSAID.
 - ii. If greater than 50% depth, surgical repair is recommend/required, especially if full-thickness. If full thickness, assess for vision, start oral antibiotics and a topical antibiotic SOLUTION, and refer. Great outcomes can be achieved with early referral and proper initial treatment.
 - c. Superficial Corneal Foreign Body
 - i. Adhered to the cornea through surface tension. Use hydropulsion with a 25g needle broken at the hub or a cannula on a 6ml syringe to dislodge the foreign body. Treat the residual superficial ulcer with a topical antibiotic and atropine.
- 6. Penetrating Ocular Trauma
 - a. Causes - dental instruments, orbital or oral blocks, gunshot, and many other small and large objects
 - b. Clinical Signs – may see corneal lacerations/rupture, scleral lacerations/rupture, uveal prolapse, hyphema, anterior uveitis, cataract, lens rupture, vitreous hemorrhage, retinal detachment
 - c. Be sure to examine the eye from all angles to determine if the injury is penetrating and, if so, to what depth. A penetrating foreign body is a surgical emergency!
 - d. Treatment – referral is imperative IF vision is present (consensual PLR). Surgical repair and/or removal of the foreign body, along with lens removal or phacoemulsification, retinal reattachment, etc. will be performed if necessary.
 - e. Sequelae – can range from small corneal scars to anterior/posterior synechia and cataract to glaucoma, septic implantation, phacoclastic uveitis, feline intraocular sarcoma, endophthalmitis, and blindness.