

VET 433A Glaucoma

Glaucoma: Disease characterized by increased intraocular pressure resulting in damage to the optic nerve and subsequent vision loss

Intraocular Pressure

Balance between aqueous humor **production** and aqueous humor **drainage**

It's basically a sink!

An increase in IOP is NEVER due to an overproduction of aqueous humor, it is always a drainage issue

Production: Ciliary body

Drainage: Iridocorneal angle (conventional)

Uveoscleral pathway (unconventional)

*Normal IOP in dogs and cats = 10-20 mmHg

How to address glaucoma

1. Acute vs chronic *Based on history and clinical signs
 - a. Acute: Vision may be able to be salvaged
 - i. Considered an emergency
 - ii. Do everything that you can to lower IOP
 - b. Chronic: Prognosis for vision is very poor
 - i. Not considered an emergency
 - ii. Goal is patient comfort

	Acute	Chronic
Clinical Signs	Blind Episcleral injection Diffuse corneal edema Mydriasis Pale optic disc Pain (blepharospasm) +/- Epiphora	Blind, episcleral injection, corneal edema, mydriasis *Buphthalmos *Corneal (Haab's) striae "corneal stripes" *Lens (sub)luxation *Cupped optic disc *Tapetal hyperreflectivity *Retinal vascular attenuation *Specific to chronic

2. Primary vs Secondary
 - a. Primary: Inherited –
 - i. Other eye will develop glaucoma in 6-12 months
 - ii. Do what you can to delay the onset in the 2nd eye

VET 433A Glaucoma

- b. Secondary: Increase in IOP
 - i. Must find and address the underlying disease

	Primary	Secondary
Causes	Inherited Breed Predilection Beagles, Basset hounds, cocker spaniels, Nordic breeds Less common in horses and cats <u>Pathophysiology</u> Inherited disease > pectinate ligament dysplasia goniodysgenesis Iridocorneal angle increasingly compromised first few years of life Drainage angle closes IOP Spikes	1. Anterior Uveitis 2. Lens luxation/subluxation (terriers) 3. Intraocular neoplasia
Clinical Signs	Very acute onset of IOP increase and clinical signs Initially unilateral Age of onset: 4-7 years Fellow eye is affected within 6-12 months	
Diagnosis	Tonometry: IOP > 25 mmHg Clinical signs suggestive of glaucoma No secondary causes identified Signalment (predisposed breed)	Tonometry: IOP > 25 mmHg Clinical signs suggestive of glaucoma Evidence of underlying disease
Treatment	Acute: Emergency to lower IOP, prophylactic therapy for contralateral eye Chronic: Start anti-glaucoma meds or consider surgical procedures (enucleation/salvage)	Address the underlying cause Uveitis-find cause of inflammation Anterior lens luxation- remove lens (fast) Intraocular tumor- Enucleation

Treatment

Aimed at decreasing the production of aqueous humor and increasing aqueous humor outflow

Medical Therapy

Prostaglandin Analogues	Carbonic Anhydrase Inhibitors	Beta Blockers	Parasympathomimetics Prophylactic therapy
Latanoprost 0.005% Bimatoprost 0.03%	Dorzolamide 2% Brinzolamide 1%	Timolol 0.5% Betaxolol 0.5%	Demecarium bromide 0.25%
Increase aqueous humor outflow Outstanding for K9 primary glaucoma!	Decrease aqueous humor production Great for primary and secondary glaucoma!	Decrease aqueous humor production Works synergistically with CAIs	Increase aqueous humor outflow via iridocorneal angel (conventional pathway)

VET 433A Glaucoma

Rapid action Administered q12 Causes increase miosis	q 8h administration Effective in dogs, cats and horses	q 12h administration Used solo for prophylaxis in contralateral eye in primary glaucoma onset can delay onset from 8 to 31 months!	Causes miosis Prophylactic medication for contralateral eye in primary glaucoma can delay onset from 8 to 31 months! q 24h administration Concurrent topical steroids q 24h
May exacerbate uveitis, contraindicated with lens luxation Not recommended for secondary glaucoma Ineffective in cats and horses	Slower onset of action than prostaglandin analogues	Not very potent as a sole agent Risk of bronchoconstriction *avoid in asthmatic cats Decreases heart rate *avoid in patients with cardiac dz	

Systemic Therapy

Mannitol 20%: Hyperosmotic > diuretic, dehydrates the vitreous body

Emergency therapy for acute glaucoma (primary glaucoma secondary to lens luxation) not for chronic glaucoma

1-2 gm/kg IV slowly over 30 min

Assess hydration, cardiac, and renal status prior to administration

Withhold water up to 4 hours post administration

Surgical Therapy

Blind eyes

Enucleation: Biopsy the enucleated globe

Evisceration and intraocular prosthesis

Pharmacologic ciliary body ablation (gentamicin, cidofovir)

Visual Eyes

Filtering procedures/valves (gonioimplants)

Transscleral laser cyclophotocoagulation

Endolaser cyclophotocoagulation