


Slide 1




I've Lost My Marbles: Let's Talk About Cataracts and Cataract Surgery

DR. AMY BRACK
DIPLOMATE AMERICAN COLLEGE OF VETERINARY OPHTHALMOLOGISTS
ANIMAL EYE GUYS

Slide 2

Cataract Formation

- ▶ Genetic/Congenital
- ▶ Trauma
- ▶ Uveitis
- ▶ Diabetes
- ▶ Retinal disease
- ▶ Electrocauterion
- ▶ Nutritional
- ▶ Irradiation
- ▶ Toxicity



Slide 3

Diabetes mellitus

- Dogs only!
- 75% incidence within one year of onset of DM
- Mechanism of action
 - Increased amount of glucose in the eye
 - Overloads the hexokinase pathway, so excess glucose shunted into sorbitol pathway
 - Enzyme Aldose Reductase is responsible for this shunting
 - Sorbitol is too big to diffuse through the lens capsule
 - Osmotic gradient = more fluid pulled into lens
 - Vasodilation of vessels
 - Lens protein aggregation

Slide 7

Quality of Life and Leveling Up

- ▶ Time to refer: early
- ▶ Antioxidants to slow down progression
 - ▶ Grape seed extract
- ▶ Prophylactic treatment of uveitis
- ▶ Question of anesthesia in the geriatric dog
- ▶ Discussion with the owner
- ▶ Sensory deprivation
- ▶ One organ systems versus multiple organ systems

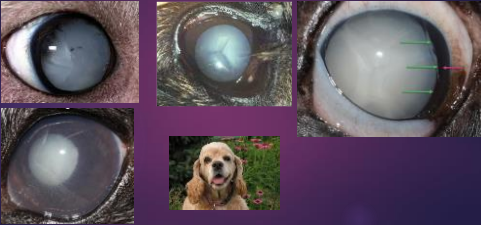
Slide 8

Surgical Candidacy

- ▶ Retinal testing
- ▶ ERG/Ultrasound
- ▶ Dental status???
- ▶ Non diabetic bloodwork
 - ▶ CBC/Chem/UA/Fasted triglyceride level
- ▶ Diabetic bloodwork
 - ▶ All the above plus fructosamine
- ▶ Timing
- ▶ Why is this important?

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Diabetic dilemmas



The slide features five images: three close-up photographs of dog eyes showing various stages of cataract formation (from a small white spot to a large, dense white mass), and two smaller images: one of a dog's face and another of a dog's eye with a cataract. The background is dark purple with a pink square in the top right corner.

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Retinal testing

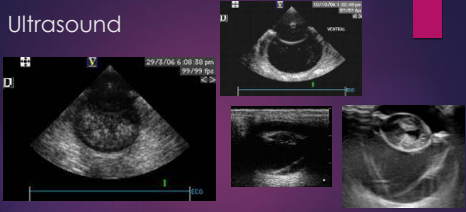


Normal ERG tracing

ERG tracing of patient with severe photoreceptor disease

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Ultrasound



Slide 12

Risks/Complications

- ▶ Retinal detachment
- ▶ Glaucoma
 - ▶ Boston Terriers
- ▶ Corneal ulcerations
- ▶ Suture dehiscence
 - ▶ E collar compliance 98% of the time
- ▶ Lipemic uveitis
 - ▶ Reason why triglycerides are so important
- ▶ Persistent uveitis
- ▶ Hyphema secondary to trauma



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Capsular tension ring for capsular instability

<https://onlinelibrary.wiley.com/doi/full/10.1111/vop.13167>



Acrivet
Capsular Tension Rings

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Post op appearance



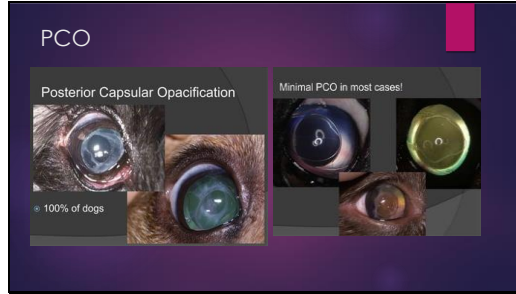
MAX before cataract surgery MAX after cataract surgery

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Fibrin



Slide 19



Slide 20



Slide 21



Slide 25

Summation

- ▶ Cataract surgery = best chance of long term vision
- ▶ Overall success > 90% with non diabetic genetic cataracts
- ▶ Owner education is key
- ▶ Early referral ensures long term success
- ▶ The reward is HUGE

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Questions?



Slide 1

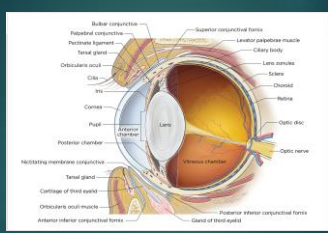


Animal Eye
Guys

For Fundic Sake: What Am I Looking At?

DR. AMY BAKER
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Slide 2

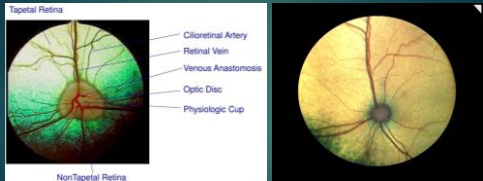


Labels in diagram:
Bulbar conjunctiva, Palpebral conjunctiva, Periorbital adipose tissue, Lacrimal gland, Oculomotor muscle, Iris, Cornea, Pupil, Posterior chamber, Horizontal intermediate conjunctiva, Tarsal gland, Cartilage of third eyelid, Oculociliary muscle, Anterior inferior conjunctival fornix, Superior conjunctival fornix, Lateral oblique muscle, Ciliary body, Latis palpebrae, Sclera, Choroid, Retina, Optic disc, Optic nerve, Vitreous chamber, Posterior inferior conjunctival fornix, Gland of third eyelid.

Kip Carter: credit

Slide 3

Anatomy: Where It All Begins



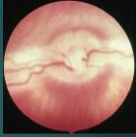
Labels for Tapetal Retina:
Cilioretinal Artery
Retinal Vein
Venous Anastomosis
Optic Disc
Physiologic Cup

Non-Tapetal Retina

Slide 4

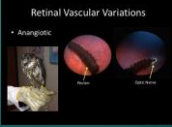
Retinal Classification

- ▶ Dog: holangiatic
- ▶ Cat: holangiatic
- ▶ Horse: pauangiatic (short distance from ONH)
- ▶ Rabbit: merangiatic
- ▶ Birds: anangiatic



Retinal Vascular Variations

- ▶ Anangiatic



Slide 5

Exam

- ▶ Menace (response)
 - ▶ Technique
 - ▶ Wind/Smell
- ▶ Dozzle (subcortical reflex)
- ▶ PLR
 - ▶ Few intact photoreceptors can still generate PLR
 - ▶ SARs - PLR frequently intact
- ▶ History
 - ▶ Night vision specifically

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Instrumentation

Direct Ophthalmoscope

Image: Real/Erect

Mag: Species/Size of eye/Working distance dependent

Lesions size: Compare to ON (ex. IDD)



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Direct Ophthalmoscope

- ▶ Dark room is key
- ▶ Right eye to the right eye
- ▶ Green or black numbers: converging lenses (positive)
- ▶ Red lenses: diverging lenses (negative)
- ▶ How this works
 - ▶ Retina in focus at OD
 - ▶ Lesion in focus at +3 (green or black): Elevated
 - ▶ Lesion in focus at -3 (red): Depressed
- ▶ Circular white light should be adjusted to patient pupil size to minimize corneal reflection
- ▶ If not dilated: use dim light to minimize pupil constriction

Slide 8

Direct Ophthalmoscope

Advantages	Disadvantages
<ul style="list-style-type: none">▶ Greater magnification than indirect▶ Availability of options like slit and grid▶ Ability to alter dioptric power	<ul style="list-style-type: none">▶ Small field of view (missed lesions)▶ Short working distance between examiner and patient▶ Lack of stereopsis (depth perception)▶ Difficulty accessing peripheral fundus▶ Greater distortion when visual axis is not transparent

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Instrumentation

Panoptic Ophthalmoscope


Good compromise between direct and indirect
Real image
Intermediate in magnification



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Instrumentation

- Indirect Ophthalmoscopy
- Focal light source
- Converging lens
- Binocular (headset: stereopsis)
- Monocular (transilluminator: no stereopsis)
- Inverted and reversed image



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Indirect Ophthalmoscopy

Advantages	Disadvantages
<ul style="list-style-type: none">▶ Larger field of vision▶ Less magnification – easier to keep lesion in focus as animal moves its head▶ Safe working distance▶ Binocular: able to hold head/stereopsis	<ul style="list-style-type: none">▶ Headset can be expensive?

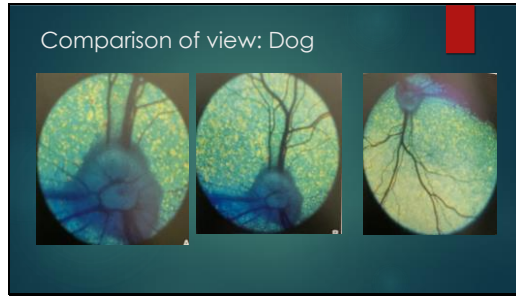
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A Word Regarding Dilution

- ▶ Short acting parasympatholytic drug only
 - ▶ Tropicamide (anticholinergic)
 - ▶ Duration of action 4-4 hours
- ▶ Careful with at risk glaucoma animals
- ▶ Ideally have baseline IOP
- ▶ NO Atropine
 - ▶ Duration of action can be up to 2 weeks
 - ▶ Atropine can worsen dry eye and elevate IOP



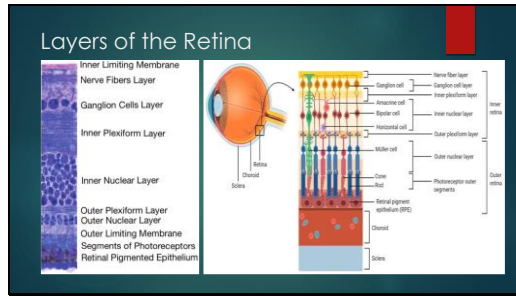
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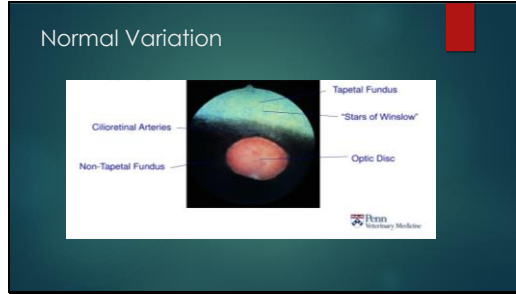
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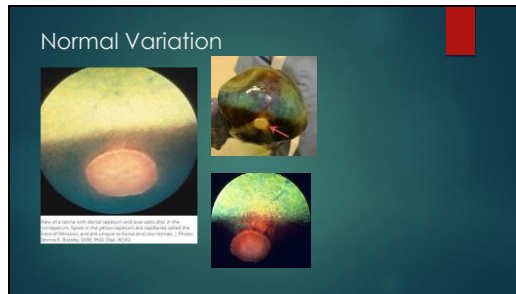
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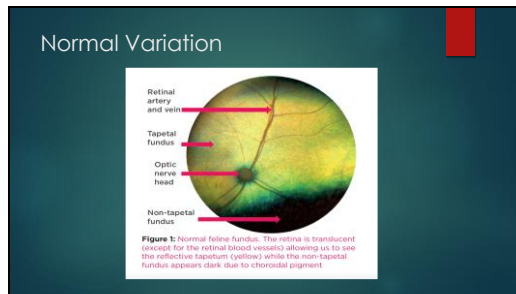
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Hypertension

Ocular changes have been reported in approximately 50% of hypertensive cats.

Figure 2: BOP 402 imaging, Left eye. Observe the optic nerve. Figure 3: BOP 412 imaging, Left eye. Note the arteriosclerosis.

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Retinal Hemorrhages

Retinal Hemorrhage

Pre-retinal
Intra-retinal
Sub-retinal

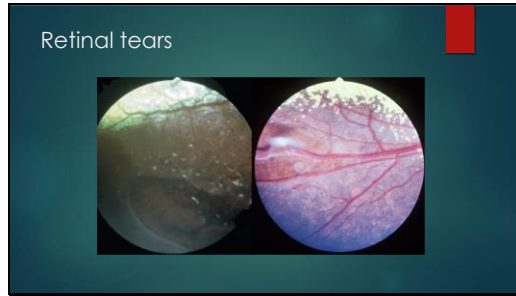
Dog with Multiple Myeloma (Hyperviscosity)
Cat with anemia
Dog with rodenticide toxicity

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Retinal Hemorrhages

- ▶ Sentle finding
 - ▶ Dogs
- ▶ Coagulopathy
- ▶ Hypertension
- ▶ Trauma
- ▶ Genetic predisposition
- ▶ Uveitis

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
<https://youtu.be/-WMzYsAX658>

Retinal Dialysis


- Treatment
 - Partial detachments
 - Retinotomy
 - Complete detachments
 - Re attachment surgery
 - High visual acuity cases in secondary patients



Partial detachment



Total detachment



Posterior vitreous detachment with vitreous hemorrhage

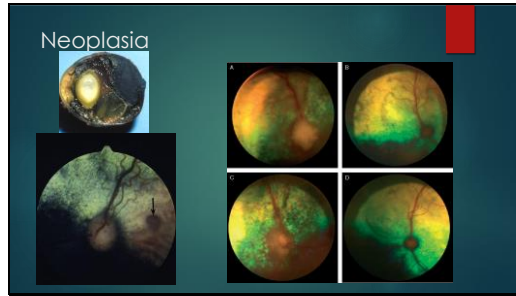
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Retinal Detachment

Diagnosis	Treatment
<ul style="list-style-type: none">▶ Exam<ul style="list-style-type: none">▶ Meteo/Dazzle▶ PLR▶ Ophthalmoscopy findings▶ Ultrasound▶ Look for the underlying cause<ul style="list-style-type: none">▶ Bloodwork<ul style="list-style-type: none">▶ CBC/Chemistry/PT/PTT▶ Infectious disease tests▶ Advanced imaging▶ Blood pressure (Doppler versus anesthesia monitor)	<ul style="list-style-type: none">▶ Obviously treat underlying cause▶ Amlodipine for hypertension▶ Tired and True▶ Steroids ideally▶ Doxycycline (tick filters first please)▶ Topicals



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Retinal Degeneration

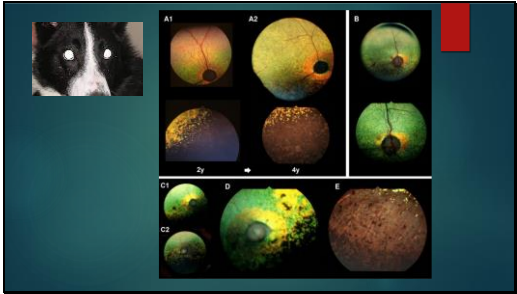
Retinal Degeneration <ul style="list-style-type: none">▶ Associated with other senile changes▶ Nuclear sclerosis▶ Iris atrophy▶ Rarely associated with cataract development▶ Usually slow to develop	PRA <ul style="list-style-type: none">▶ Genetic predisposition▶ Affected early▶ Slow progression▶ Breed determines age of onset and age of ERG affects (first)▶ Various forms▶ Too numerous to mention▶ Cataracts common▶ Reason for ERG as pre cataract screen▶ Genetic testing for various forms
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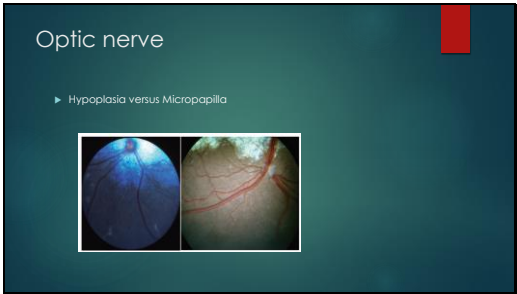
Findings

<ul style="list-style-type: none">▶ Vascular attenuation▶ Diffuse hyper reflectivity (retinal thinning)▶ Non tapetal striations/pigment patches▶ Atrophic optic nerve▶ Peripapillary hyper reflectivity▶ Bilateral disease▶ PLR dysfunction▶ Typical vision loss noted at night<ul style="list-style-type: none">▶ Can progress to day vision▶ Maze testing	
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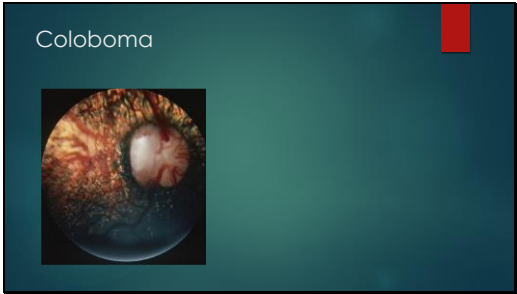
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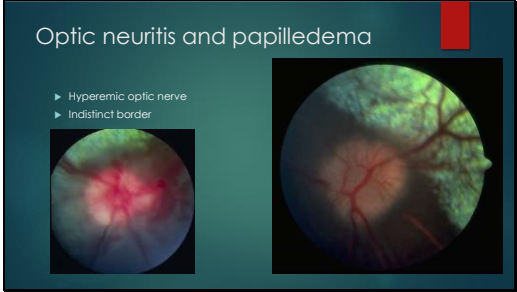
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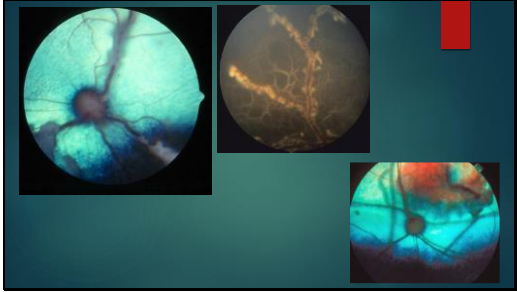
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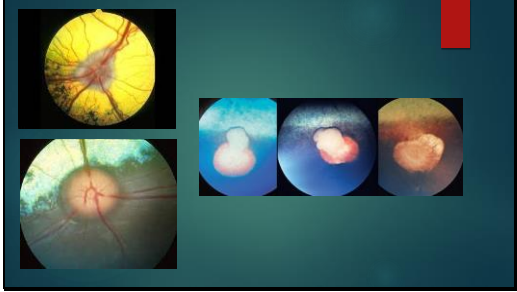
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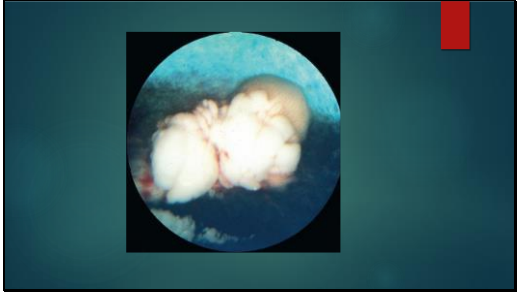
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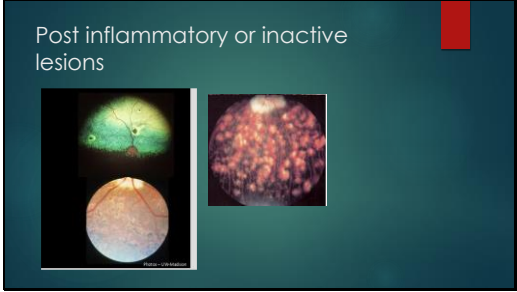
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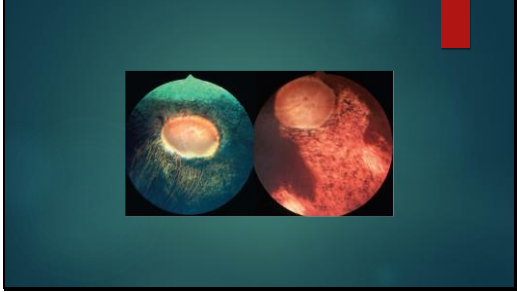
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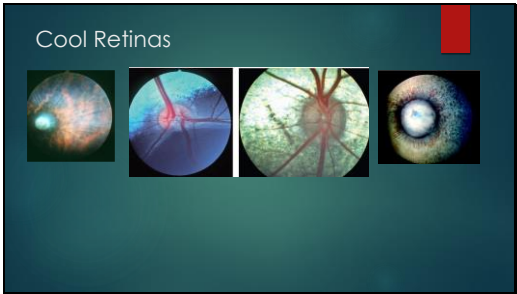
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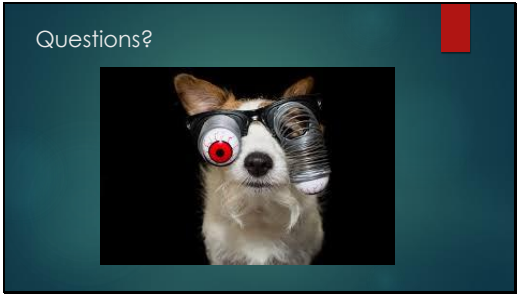
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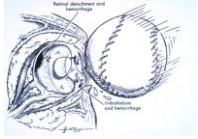
Slide 1

**RALPHIE'S MOM
WAS RIGHT: YOU
CAN SHOOT AN
EYE OUT**



Slide 2

- Can cause extensive injury
- Subconjunctival hemorrhage
- Globe rupture
- Hyphema
- Uveitis
- Glaucoma
- Retinal Detachment
- Orbital Fracture
- Proptosis
- Fat prolapse
- Lens luxation



A BRIEF WORD ABOUT BLUNT TRAUMA

Slide 3

BLUNT TRAUMA




Slide 4

MEDICAL THERAPY

- Topical antibiotic if ulcerated OID
- Pred acetate QID if not ulcerated
- Diclofenac QID
- +/- Atropine SID
- Lubricant (Optixcare, Genteal gel) QID
- +/- Dorzolamide/timolol
- Oral antibiotic
- Oral anti-inflammatory
 - Prefer 0.5 mg/kg BID prednisone preferred, otherwise an NSAID
- Oral pain medication
- E-collar

Temporary tarsorrhaphy may be indicated

Recheck 48 hours



Slide 5

SHARP TRAUMA

- Cat in the vicinity?
- Metal, glass, needles...
 - Ensure cause is not persistent
- Better prognosis than blunt trauma
- Lens affected?
- Usually damage is easily identified
 - Puncture
 - Laceration



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MEDICAL THERAPY

- Topical antibiotic q 4-6 hrs
 - Use drops
- Atropine SID
 - Use drops
- Lubricant
 - Water, not petroleum, based (Optixcare, genteal severe)
- Oral antibiotic
- Oral anti-inflammatory
- Oral pain medication
- E-collar



Recheck 24 hours 

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TREATMENT

- If the client calls ahead of time
- Lubrication Lubrication Lubrication
 - KY
 - Artificial tears
 - Honey
 - Corn syrup
 - Olive or corn oil

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YOUR MISSION


- Remember to assess the rest of your patient
- A dead patient is NEVER visual
- Clean the Eye
 - Saline and dilute betadine solution (not scrub)
 - Weak tea color
- Temporary tarsorrhaphy
 - Stents
 - IV tubing or rubber bands
 - Correct suture size: 3-0 or 4-0 Nylon or Silk



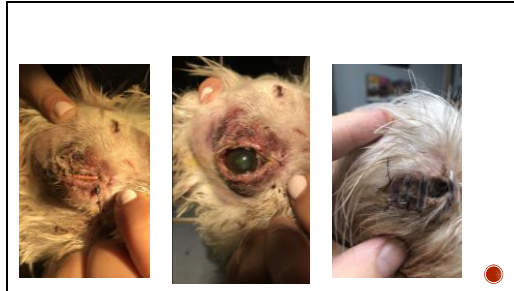
Slide 12

PROPTOSIS TREATMENT

- Leave sutures in for as long as they have tension
 - 2-3 weeks ideal
- Do NOT send to the ophthalmologist the next day
 - I do love you dearly though - really I mean that
- Collar
- Antibiotic drops or ointment topically
- Oral antibiotic
- Oral steroids ideal



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Slide 14

SUSPECT NUMBER 2: EYELID LACERATION

- Got a bleeder!
- Prevent further self trauma
 - E-collar
 - Sedation
- Keep cornea lubricated
- Keep clean
- Primary closure of lid



The slide contains two images. The left image shows a dog's head with a white E-collar (E-collar) around its neck. The right image is a close-up of a dog's eye with a laceration on the eyelid.

Slide 15

SUTURE

- Conjunctiva
 - 6-0 or 5-0 absorbable (Vicryl, PDS)
- Skin
 - 6-0 or 5-0 non-absorbable (mersilene, prolene)
 - If fractious patient; consider absorbable

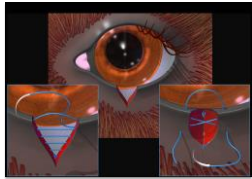


The image shows a package of Ethicon Prolene suture. The package is white and blue, with the text 'ETHICON PROLENE BLUE MONOPLAMENT' visible. It also includes technical specifications like '6-0', 'BV-1', and '8805'.

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TWO LAYER CLOSURE

- Close conjunctiva in a continuous horizontal mattress pattern beginning proximally and working toward lid margin. Bury knot.
- In skin, the single most important stitch is at the eyelid margin
 - Correct apposition is key!
- Place cruciate first, followed by simple interrupted sutures



Ensure no rubbing sutures; cut tags toward eye sheet

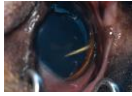


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SUSPECT NUMBER 3: CORNEAL LACERATION

Eyelid Laceration's more menacing twin
High risk for loss of vision AND the globe
Best to immediately refer
Prevent self trauma
Rinse gross debris if possible
DO NOT CUT OR PULL Tissue
Usually hemorrhagic/serous discharge
Possible hypotonic globe



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SUSPECT NUMBER 4: FOREIGN BODIES

Illegal immigrants of the eye

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FOREIGN BODIES CONTINUED...

- Topical proparacaine
- Cotton tip applicator or fine toothed forceps
- Firmly embedded requires surgery
- Removal will cause corneal ulcer
- Treated per usual
- Should heal quickly


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MORE FOREIGN BODIES



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SUSPECT NUMBER 5: GANG OF BLOODS



- Subconjunctival hemorrhage
 - PE and diagnosis of underlying issue
 - Trauma (choking)
 - Coagulopathy
 - Treatment of underlying issue
 - Supportive care
 - Topical and systemic antiinflammatories

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- I scream, you scream, we all scream for hypem...A
- Shady cast of characters
 - Trauma
 - Coagulopathies
 - Systemic Disease
 - Tick borne diseases
 - Intraocular tumors
 - Unilateral
 - Middle age to older pet
 - Hypertension
 - Retinal detachment

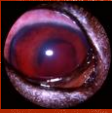


I SCREAM, YOU SCREAM, WE ALL SCREAM FOR HYPHEM...A

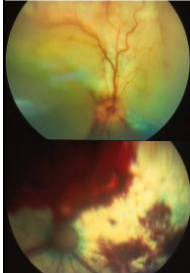
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TREATMENT OF HYPHEMA

Diagnose and treat the underlying cause
Consider ocular ultrasound
Rest
Topical steroids
Atropine
Provided frequently checking IOP
Possible glaucoma medications
Avoid latanoprost
Oral steroids
NSAIDs??




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HYPERTENSION

- Most common in older cats
- Retinas can detach and reattach in cats multiple times
 - Retinal degeneration with each detachment
- Vitreal bleeding poorer prognostic indicator
- Return of PLRs is a favorable prognostic indicator
- Acute blindness
- Systemic work up
- Amlodipine


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SUSPECT NUMBER 6: ORBITAL FAT PROLAPSE

- Secondary to conjunctival laceration or blunt trauma
- Pink mass effect usually close to third eyelid
- Exposure can lead to ulceration and irritation
- Surgical repair

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SUSPECT NUMBER 7: CORNEAL PERFORATION

- As with corneal laceration it is a surgical emergency
- Assess vision
- Consider enucleation if no vision
 - Could consider third eyelid flap or temporary tarsorrhaphy
- Cover with systemic antibiotics
 - Direct communication with external environment
 - Risk for enophthalmitis

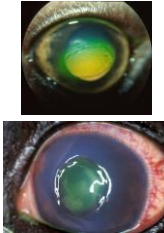
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SUSPECT NUMBER 8: CORNEAL BURNS

- Flush
- Flush
- Flush
 - IV fluids or eye wash
- Treat as if ulcerated
 - Take your bet to Vegas that it will be
 - Consider serum for comfort and to encourage healing
 - Usually the entire cornea will ulcerate
- Can melt
 - Walking stick
 - Insect sting




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SUSPECT NUMBER 9: CORNEAL ULCERS

- The cornea is a sandwich
 - Stroma wedged between the epithelium and endothelium
- Simple versus Complicated
- Superficial versus Deep
- Melting
 - Bacteria
 - Leukocytes
 - Fungus

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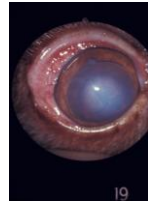
TREATMENT OF CORNEAL ULCERS

- E collar
- Topical antibiotics
- Serum or EDTA in case of melting
- Lubricant
- Systemic anti-inflammatories
- Question of a topical anti-inflammatory
- Possible oral antibiotics
- Oral pain control
- Atropine
 - Is not an adequate pain reliever
 - No effect after pupil is dilated

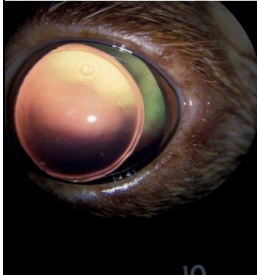
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SUSPECT NUMBER 10: ANTERIOR LENS LUXATION

- Refer immediately
- Typically glaucoma is present
 - Younger patients
 - Primary zomular deficiency
 - Trauma
- Less of an emergency in normotensive older dog
- Where you place the tonopen on the cornea influences reading



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ANTERIOR LENS LUXATION TREATMENT

- Carbonic anhydrase inhibitors
 - Dorzolamide or combination dorzolamide/timolol (beta blocker)
- Timolol as a sole agent is useless
 - Except in prophylactic therapy
- Avoid latanoprost
- Can consider IV mannitol 20% if referral not an immediate option
- Anterior lens luxations in the face of buphthalmia and blindness are NOT emergencies

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POSTERIOR LENS LUXATION

- Look for iridodonesis
- Leave it!
- Add latanoprost (miotic) BID
- +/- topical NSAID SID
- Owner education
 - Give latanoprost as close to q12 hours as possible to maintain miosis
 - If white opacity visible in the front part of the eye, do not give latanoprost and call vet
 - Lifelong risk of uveitis, glaucoma, and retinal detachment
 - If breed related (especially terriers), other lens is at risk

Slide 33

Iridodonesis




Heterochromic dog with bilateral posterior lens luxations on latanoprost

Slide 34

SUSPECT NUMBER 11: THE GLAUCOMA

- Early signs associated
- Vision loss in the face of increased pressure
- Damage to the optic nerve
 - Snowball defect
- Pain
- Mydriatic pupil
- Vascular engorgement
- Corneal edema (inconsistent)
 - Usually over 15mmHg
- Reverse of the dog with recurrent conjunctivitis
- Ocular discharge
- Unilateral
- Bilateral if secondary



Slide 35

CLINICAL SIGNS

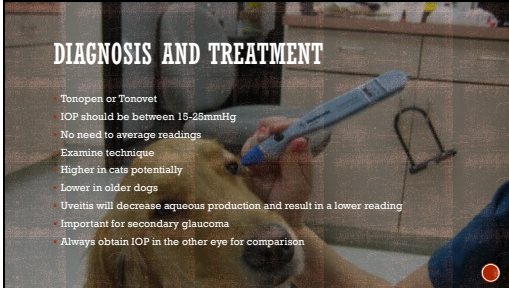
- Episcleral vessel congestion
- Buphthalmia
- Corneal edema
- Mid/deep stromal corneal vessels
- Haab's striae
- Flare
- Mydriasis
- Lens subluxation/luxation
- Retinal and optic nerve degeneration
 - Peripapillary edema
 - Optic nerve head cupping
 - Tapetal hyperreflectivity
 - Retinal vessel attenuation

Clinical signs are on a sliding scale and vary depending on glaucoma stage

Slide 36

DIAGNOSIS AND TREATMENT

- Tonopen or Tonovet
- IOP should be between 15-25mmHg
- No need to average readings
- Examine technique
 - Higher in cats potentially
 - Lower in older dogs
- Uveitis will decrease aqueous production and result in a lower reading
- Important for secondary glaucoma
- Always obtain IOP in the other eye for comparison



Slide 37


DIAGNOSIS

- Take clinical signs into consideration
- Positioning can falsely elevate IOP
 - Ideally have patient in sternal recumbency
 - Avoid pressure on neck
 - Avoid pressure on eyelids
 - Remove tight collars/restraints

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TREATMENT

- Goal is to reduce IOP as quickly as possible
- Topical carbonic anhydrase inhibitors
 - Dichloramide
- Topical beta blockers
 - Timolol
- Prostaglandin analog
 - Latanoprost (remember the lens)
- Oral CAI
- Hyperosmotics (pre medicate with dexamethasone 0.2mg/kg IV to avoid retinal reperfusion injury)
 - 1 gram/pound over 30 minutes



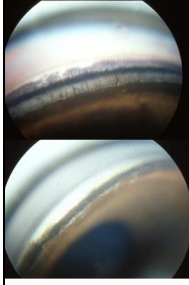
Slide 39

TREATMENT



- If unresponsive and immediate referral is not possible: consider paracentesis
- Preparation
 - 27g or 30g needle
 - At the limbus
 - Avoid the iris and lens
 - Allow fluid to reach the hub and pull out
 - Fluid will continue to leak through the hole
 - Apoptotic lamellae will rebound/Temporary effect
 - Repeated attempts
 - Increased risk for infection
 - Produce uveitis

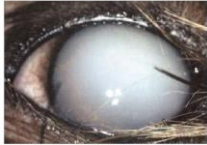
Slide 40



GLAUCOMA CONTINUED

- Remember you are actually treating both eyes
 - Primary closed angle glaucoma
 - Other eye is at risk
- Cats
 - Usually visual longer than dogs
 - More resistant to medications
 - Latanaprost
 - No F2 receptors/Possess E2
 - Usually secondary to previous and recurrent uveitis

Slide 41



SUSPECT NUMBER 11: LIPEMIC UVETITIS

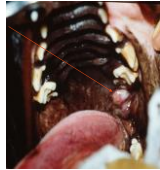
- Blizzard effect
- Follows a fatty meal
- Breakdown in blood aqueous barrier
- History
- Asking the same question multiple ways
- Blood (strawberry milkshake)
- Confirm with triglyceride level
- Fasting as indicated
- Topical steroids +/- atropine

Figure 6. Lipid-laden aqueous humor appears more creamy white than aqueous flare.


Slide 42

THE DIRTY DOZEN: ORBITAL CELLULITIS/ABSCESS

- Acute onset
- PRINTFUL
 - Manipulation of mouth
 - Retropulsion of the eye
- Possible fever
- Unusually unilateral
- Oral exam
 - Swelling posterior to last molar
 - Corresponding lymph node enlargement




Slide 43



ORBITAL CELLULITIS/ABSCESS

- Exophthalmos
- Elevated third eyelid
- Possible corneal ulcer
 - Lack of blink from lids
- Optic neuritis possible


Slide 44



ETIOLOGY

- Infection
 - Wound or foreign body lodged in palate or orbit
 - Ticks stick or awlheads
 - Tooth root abscesses
 - Abscess of salivary or lacrimal glands
- Idiopathic
- Migrating larvae

Slide 45



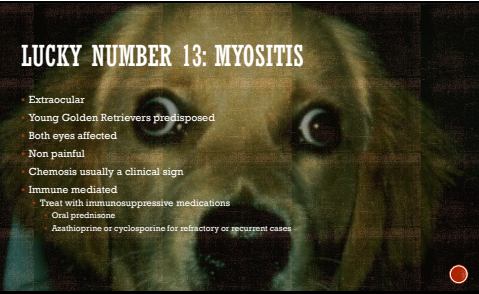
TREATMENT

- Create drainage
- Culture and Sensitivity
- Systemic antibiotics
- Systemic anti-inflammatories
- Dental if indicated
- Supportive care
 - Warm compress
 - Temporary eyelid closure
 - Lubricant
- Pain Control

Slide 46

LUCKY NUMBER 13: MYOSITIS

- Extraocular
- Young Golden Retrievers predisposed
- Both eyes affected
- Non painful
- Chemosis usually a clinical sign
- Immune mediated
 - Treat with immunosuppressive medications
 - Oral prednisone
 - Azathioprine or cyclosporine for refractory or recurrent cases



Slide 47

MYOSITIS



- Masticatory
- Painful on manipulation and unable to fully open mouth
- Immune mediated
 - Antibodies against type 2 muscle fibers
 - Biopsy for confirmation
- Variable severity
- Recurrence common
- Shepherds predisposed
- Can affect optic nerve
- Same treatment as EOM

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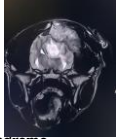
ROUNDING OUT THE LIST OF SUSPECTS



Slide 49

ACUTE BLINDNESS DDXS

- Glaucoma
- Retinal detachment
- Optic neuritis
- Sudden Acquired Retinal Degeneration Syndrome
- Central disease
 - Brain tumor, seizures, GME ...
- Toxicity
 - Baytril, Ivermectin




Slide 50

AEG CONTACTS – REACH OUT ANYTIME

- List of personal cell numbers (please use but do not give out to clients)
- Dr Rob Swinger: 954-898-8448 (Coral Springs)
- Dr Amy Baker: 510-449-2201 (Coral Springs/Wellington)
- Dr Laura Proietto: 502-592-8272 (Ft Lauderdale)
- Dr Jessica Martinez: 774-230-0201 (Miami Gardens)
- Dr Cheriene Delgado: 608-987-2870 (Miami – Bird Road)
- Dr Alessandra Keenan: 770-757-9887 (Miami Garden and Ft Lauderdale)
- Dr Taryn Overton: 402-440-8889 (West Coast)



Slide 1




To Debride or Not Debride: A Shakespearean Approach to Corneal Ulcer Management

DR. AMY BRADY
DIPLOMATE, AMERICAN COLLEGE OF VETERINARY OPHTHALMOLOGISTS
ANIMAL EYE GUYS

Slide 2

Corneal Ulcers

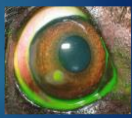
- ▶ Three basic types of corneal ulceration
 - ▶ Simple, uncomplicated, non-infected, superficial
 - ▶ Non healing, non infected, superficial
 - ▶ Infected, stromal loss, +/- perforation risk



Slide 3

Corneal ulcers

- ▶ Simple, non-complicated, non-infected, superficial
 - ▶ Examples: grooming, playing, after surgery (cause typically known)
 - ▶ A simple ulcer should heal in 3-5 days (give up to a week)
 - ▶ Treatment:
 - ▶ Broad-spectrum topical antibiotic TID - QID
 - ▶ 1 drop is a complete dose
 - ▶ +/- Topical atropine q 24hr
 - ▶ Remend/Ocufenis - not sufficient as primary therapy
 - ▶ +/- Oral pain medication (NSAID and/or gabapentin)
 - ▶ E collar at all times (most overlooked part of the treatment plan)
 - ▶ Recheck prior to stopping meds



Slide 4

Non Healing Corneal Ulcers

- Traditional SCEDD**
 - ▶ Breed predisposition
 - ▶ Boxer
 - ▶ Bulldogs
 - ▶ Middle aged to older
 - ▶ Young dogs DO NOT get a traditional SCEDD
- Mechanical/Anatomic**
 - ▶ Eyelash/cilia abnormalities (ectopic cilia, distichia)
 - ▶ Eyelid abnormalities (entropion, ectropion, masses)
 - ▶ Exposure and blink reflex abnormalities
 - ▶ Tear film abnormalities
 - ▶ Foreign bodies (including mineral)
 - ▶ Feline sequestrum
 - ▶ RHV !

Slide 5

Diagrams illustrating eyelid/cilia abnormalities: Normal, Distichia, Ectopic Cilia, and Trichiasis. Includes photos of a dog's eye with a corneal ulcer and a dog's eye with a foreign body.

Slide 6

Photos illustrating various corneal ulcers and conditions, including a dog's eye with a large ulcer, a dog's eye with a foreign body, and a dog's eye with a corneal sequestrum.

Slide 7

Tear Film Deficiency

- ▶ Traditional KCS versus qualitative tear film deficiency
- ▶ Only difference is STT value
- ▶ Worthless diagnostic in cats
- ▶ Tear film dynamics
 - ▶ Aqueous layer
 - ▶ Fat layer
 - ▶ Mucus layer

LIPID (OIL)
Prevents tears film evaporation

AQUEOUS (WATER)
Contains water and nutrients

MUCIN (MUCOUS)
Spreads tear film evenly over eye

Slide 8

Traditional KCS

- ▶ <15mm/min STT value in Dogs
- ▶ Mucopurulent discharge is the hallmark
- ▶ Optimmune versus Cyclosporine versus Tacrolimus
- ▶ Slow release cyclosporine implant
- ▶ Poor response in congenital alacrima
- ▶ PDT surgery
- ▶ LIFELONG treatment typically

Slide 9

Qualitative KCS

- ▶ May be responsive to Lubricant or Optimmune
- ▶ Role of chronic conjunctivitis or eyelid disease (tumors/blepharitis/atopy)

Slide 13

Quiz: Foreign Body or Not



The slide contains five small images of animal eyes. The top row has three images: a normal eye, an eye with a small white spot, and a dog's eye with a white spot. The bottom row has two images: a large white corneal lesion and a dog's eye with a white spot.

Slide 14

Indolent ulcers



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- ▶ Spontaneous chronic corneal epithelial defect (SCCED)
- ▶ Superficial with epithelial lip
- ▶ Technically not infected
- ▶ Abnormal adhesion complexes

Slide 15

SCCED
(superficial chronic corneal epithelial defect)

Treatment:

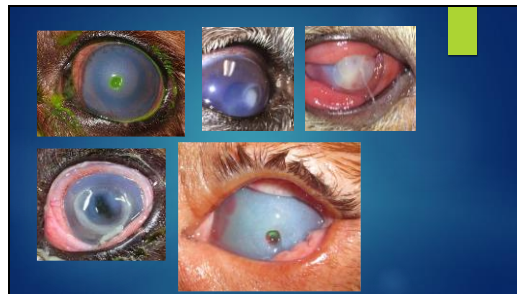
- ▶ If SCCED (superficial chronic corneal epithelial defect), corneal debridement and grid keratotomy +/- BCL or collagen shield
- ▶ Topical broad spectrum antibiotic solution q8hr (neopolygram or tobramycin)
- ▶ Topical hyaluronan product 8hr (Remend, Optixcare, dilute Adequan, other similar product)
- ▶ Topical atropine solution q24hr
- ▶ Systemic pain medication (NSAID +/- gabapentin)
- ▶ Systemic anti-collagenase (doxycycline 5mg/kg q12hr)
- ▶ E-collar at all times

Slide 19

Severe Ulcers

- ▶ Infected, stromal loss, perforation risk, consider referral
- ▶ Often difficult without slit lamp to accurately judge lesion depth
- ▶ Painful, yellow/green mucoid discharge; lesion often has yellow corneal infiltrate +/- hypopyon
- ▶ Infections can lead to perforation within 24 hours
- ▶ General rule of thumb: >30% of the cornea stroma needs to be intact in order to heal a lesion with aggressive medical management without perforation
- ▶ <30%: immediate surgical intervention is warranted

Slide 20




Slide 21

Severe corneal ulcers

- ▶ Infected corneal ulcer
 - ▶ Aerobic culture and sensitivity (3-5 days) – most common agents are: Staph, Strep, and Pseudomonas
 - ▶ Quick reference: in-house cytology (rods vs. cocci)
 - ▶ Broad spectrum antibiotics (pending culture)
 - ▶ Topical fluoroquinolones & sulfonamides q 2hr for 48hr then 4-6hr (may also consider a feline generalist/ fluoroquinolone alone instead (such as moxifloxacin)
 - ▶ Systemic marbofloxacin or enrofloxacin & doxycycline
 - ▶ MMPs and serine proteinases inhibitor (serum q 2hrs for 48hr; then 4-6hr)
 - ▶ Anti-inflammatory
 - ▶ Topical NSAID (PAUSE)
 - ▶ Systemic NSAID (preferred) or corticosteroid
 - ▶ Pain management
 - ▶ Topical atropine q 24hr (PAUSE)
 - ▶ Systemic gabapentin q 8-12hr (10mg/kg)
 - ▶ Trazodone q8-12hr (5-10mg/kg) if needed for sedation
 - ▶ E-collar at all times; no neck leads; limit activity

Slide 22

Complicated ulcer

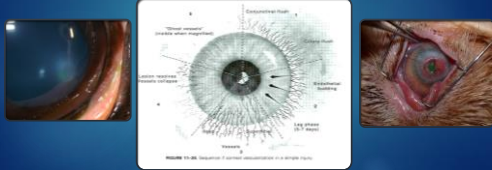


- ▶ Worry about deeper not bigger
- ▶ No ointments if deep
- ▶ 1 drop is a complete dose. 2 drops equals waste for the most part
- ▶ 1 drop = around 50 microliters
- ▶ Conjunctival fornix can hold at max 30 microliters
- ▶ Do not switch topical antibiotics without sufficient reason
- ▶ Serum – do you really want it from your patient?

Slide 23

A note about Healing

▶ Vascular versus nonvascular healing



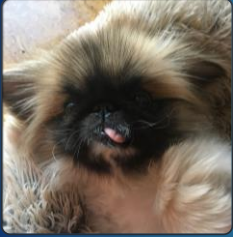
The diagram shows the eye's vascular network with labels for the ciliary body, iris, and choroid. The surgical flap image shows a third eyelid flap being used to cover the eye.

Slide 24

When medical therapy is failing.....

- ▶ Ideally, do not use a third eyelid flap – cannot visualise the globe; may be beneficial for support once the infection is controlled
- ▶ Temporary lateral tarsorrhaphy
 - ▶ Horizontal mattress suture, 5-0 suture (nylon, silk, prolene)
- ▶ Tissue glue
 - ▶ Provides tectonic support and has antibacterial properties; will perforate the globe when setting if too fragile





Questions?
