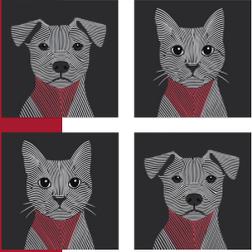


Ocular Adnexal Procedures:
Eyelids, Third Eyelids, and Nasolacrimal Ducts

Rachel Matusow Wynne, DVM, MS, DACVO




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AGENDA

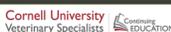
- Entropion
- Eyelid masses and lacerations
- Prolapsed gland of the third eyelid
- Nasolacrimal duct disease




2

Agenda:

- Entropion
- Eyelid masses and lid lacerations
- Prolapsed gland of the third eyelid
- Nasolacrimal duct disease

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Entropion

- Spastic
 - Underlying painful disease → blepharospasm → progressive inward rolling of lids
- Primary
 - Most common in young patients (dogs>cats)
- Secondary
 - Typically seen in senior patients (cats>dogs)

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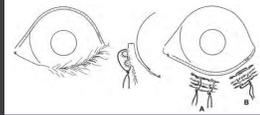
Spastic entropion

- Pain induced
 - Corneal ulceration – the chicken or the egg?
 - KCS
 - Trichiasis/distichiasis/ectopic cilia
 - Foreign body
 - Atopic blepharitis

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Spastic entropion

- How do you distinguish primary from spastic entropion?
 - Age and signalment
 - A middle-aged dog has likely had the same propensity for entropion for several years, likely that something pushed it over the edge
 - Is there any evidence of another underlying issue?
 - If not, probably primary entropion
 - Proparacaine – *might* immediately resolve the entropion
 - Tacking sutures, temporary tarsorrhaphy, or a bandage contact lens can provide temporary relief if unsure that surgical correction is necessary

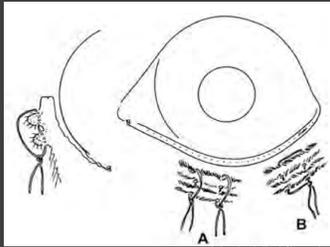


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Spastic entropion – Tacking Sutures

- Local anesthesia +/- sedation OR brief general anesthesia
 - In a good patient: Try liposomal lidocaine cream (ex. Numb520)
- Non-absorbable sutures
 - Prolene, Nylon
- Recommend ~3-0 to 5-0 (I use 4-0 nylon)
- 2-4 partial thickness interrupted Lembert-type (inverting) sutures
- Leave in place until primary cause of pain is resolved (often tolerated for 3-4 weeks)
 - Then: reassess eyelid position, watch for relapsing ulceration, etc.

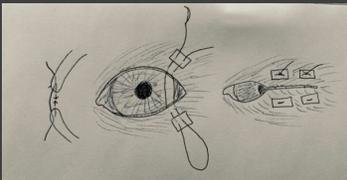


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Spastic entropion – Temporary Tarsorrhaphy

- Local anesthesia +/- sedation OR brief general anesthesia
 - In a good patient: Try liposomal lidocaine cream (ex. Numb520)
- Non-absorbable sutures
 - Prolene, Nylon
- Recommend ~4-0 to 5-0 (I use 5-0 prolene)
- 1-2 mattress-type sutures with stents
 - I use sterilized rubber bands
- Leave in place until primary cause of pain is resolved (often tolerated for 2 weeks)
 - Then: reassess eyelid position, watch for relapsing ulceration, etc.



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Primary entropion

- Young animals up to 1-2 years of age
- Conformational factors contributing to entropion may include:
 - Eyelid length >> necessary for globe size
 - Unstable eyelid → entropion/ectropion more likely
 - Excessive facial skin/wrinkles
 - Orbit/skull anatomy – relative enophthalmia, prominent brow, etc.



Euryblepharon/
macroblepharon
with lower lateral
entropion in a 1.5
YO Newfoundland

Manually everted

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Primary entropion <4 months

- Typically too young to justify surgical correction
- Continued growth will change their head conformation
- Important to address, however, to avoid scarring, ulceration, chronic pain



Cornell School of Medicine, College of Veterinary Medicine, Veterinary Ophthalmic Surgery (Gentini & Gelatt) 2011

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Primary entropion <4 months

- Tacking sutures
- Reassess every 2-4 weeks
- May need to replace if sutures break or growth changes lid positioning
- Advise owner to monitor for contact of sutures with cornea
- Entropion may resolve or the sutures may buy time until definitive surgical correction can be performed



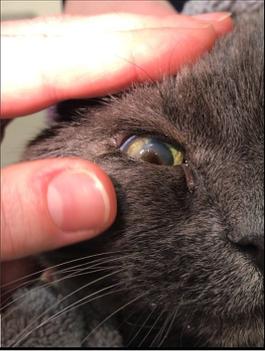
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Primary entropion > 4 months

- Sufficient skeletal and cutaneous maturity to justify definitive surgical intervention.
- Lower lid most commonly affected
 - Retrievers, English Bulldogs, Mastiffs, etc.
 - Often present within first two years of life.
- Variety of surgical techniques available



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Hotz Celsus Procedure

- An art, not a science
 - The most difficult part of entropion surgery is the decision making
- For eversion of the lid margin to correct straightforward entropion



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Hotz Celsus Procedure

- Preferred ophthalmic instruments:
 - Jaeger eyelid plate
 - Caliper (or blade handle with measurements)
 - Surgical marker
 - Bishop Harmon forceps (small dogs/cats) or rat tooth/Brown-Adson for larger dogs
 - Stevens tenotomy scissor, small Metzenbaum scissor
 - Castroviejo or Derf needle holder – appropriate for 5-0 suture
 - Blade: 6700 beaver or 15 Bard-Parker type blade
 - Suture: 5-0 or 4-0 Vicryl Rapide – I use exclusively 5-0
 - Suture alternatives: silk, prolene, nylon, monocryl, etc.
 - Beware memory/stiffness causing corneal contact.



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Hotz Celsus Procedure

- Incision 1: Partial thickness, 1-2mm from lid margin
 - Approximately at the haired/non-haired junction
- Incision 2: Partial thickness, curvilinear
 - Max distance from incision 1 depends on severity of entropion
 - Measure this distance to guide correction of contralateral eye
 - Assess improvement post-op for future reference
- Excise the delineated crescent of skin – partial thickness
 - Scalpel blade vs. tenotomy or Metzenbaum scissors depending on the nature of the eyelid tissue/size of the animal
- Closure via "bisecting" sutures (5-0 Vicryl Rapide or monofilament non-absorbable)



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Hotz Celsus Procedure



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Hotz Celsus Procedure



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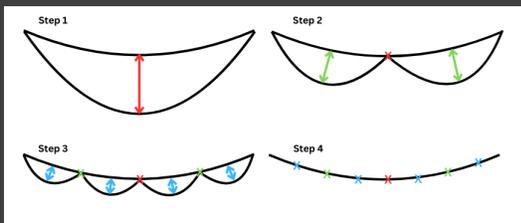
Hotz Celsus Procedure



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Hotz Celsus Closure: Bisecting sutures



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- Using absorbable sutures (which don't need to be removed), allows us to keep the suture ends short to minimize risk of corneal contact.
- When non-absorbable sutures are used, the end pointing toward the cornea can be cut close and the end pointing away can be left long.

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**Hotz Celsus Procedure:
2 weeks post-op**

- Lid positioning should be appropriate at this point
- If you placed non-absorbable sutures, consider having patient come in on sedation of choice

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Hotz Celsus + Wedge PowerPoint AI suggested this was a picture of a tape measure...

- Macropblepharon or euryblepharon are so often involved in entropion
 - → My most frequent entropion procedure combines a wedge resection with a Hotz-Celsus.
- See eyelid mass removal section for details on wedge resection closure.

Figure 15.3:
 Veterinary Ophthalmology (p. 2726). Wiley, Kindle Edition.

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Hotz Celsus Procedure

- Common errors
 - Incisions are too far away from the lid margin
 - The eyelid margin needs to PIVOT – first incision needs to be close to lid margin!
 - Not removing enough
 - Always warn client of potential for revision
 - Worried about contact of sutures with corneal surface? Throw in a few tacking sutures out of precaution
 - Removing too much
 - Remember patient will be enophthalmic intra-op – make most of surgical decisions under premeds or awake
 - Iatrogenic ectropion is MUCH harder to fix – err on the side of caution



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Hotz Celsus Complications

- Dehiscence due to self-trauma
 - Using the e-collar is so much cheaper than a second surgery...
- Dehiscence due to infection
 - Avoid operating during atopic dermatitis flare if possible
 - Systemic antibiotics only if suspect pre-existing skin susceptibility to infection or post-op concern for infection
- Trichiasis – may need a revision
- Exposure keratitis – likely needs a revision by an ophthalmologist

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Hotz Celsus Complications



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Secondary entropion

- Seniors with loss of retrobulbar fat or increased skin laxity
 - Especially cats with CKD, hyperthyroidism
 - Especially Golden retrievers – upper lateral entropion
- Can treat with Hotz Celsus but...
- If poor candidate for anesthesia or client wants to avoid surgery in senior pet:
 - Consider referral for hyaluronic acid subdermal filler ("lid filler")



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Secondary entropion

- Lid filler
 - Best for mild cases that can't undergo surgical intervention
 - Often done without sedation (patient temperament dependent)
 - MacDonald *et al* 2018
 - Resolved entropion in ~90% of patients
 - But short follow-up: Median 152 days
 - Clinical experience:
 - Using topical liposomal lidocaine cream (leave on 20+ minutes) makes a huge difference.
 - If lid clients there are three possibilities:
 - We won't be happy with the immediate results and will want to go to surgery.
 - We will be happy immediately, but the improvement won't last
 - The improvement will be permanent, allowing us to avoid surgical intervention entirely

an-vision
an-AlayVet

Hyaluronic acid gel
24mg/ml

Intended for facial tissue augmentation in animals

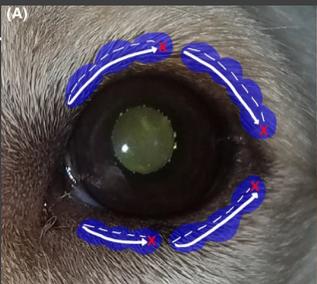
Hyaluronsäuregel
24mg/ml

Zur Gewebeaugmentation von Fazialgewebe von Tieren

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(A)



ALAYNA Lid Filler



Before



After

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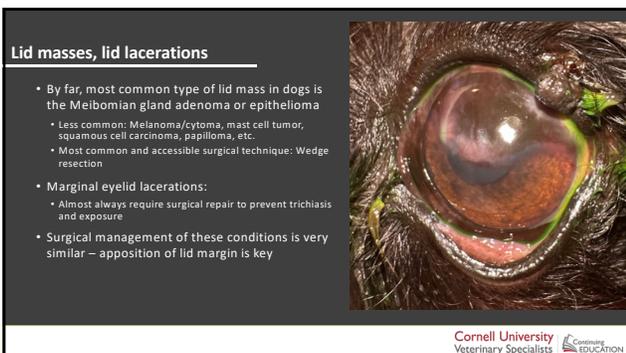
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Lid masses

- Why remove a benign Meibomian gland adenoma?
 - Excessive ocular discharge, discomfort, secondary corneal disease (pigment, neovascularization, ulceration)
 - Almost invariably progressive over time
 - Much easier to remove when they're small



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Lid masses

- Wedge resection or house shaped
 - Size dependent – you can remove ~30% of lid margin without extensive reconstruction
 - Remove ~1mm on each side of the mass
 - Use Jaeger eyelid plate to stabilize/cut against
 - Outline mass with partial thickness skin incision using 15 bard-parker or 6700 beaver blade
 - After creating skin incisions with a blade, complete incisions with small metzenbaum scissors
 - It WILL recur if you do not get margins



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Eyelid Masses

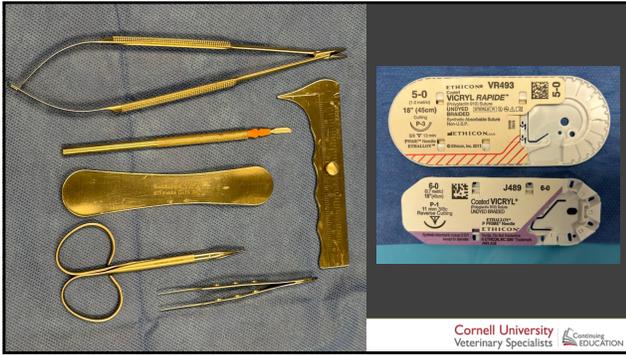
- Closure: prefer 2 layered closure
- Always start at the lid margin and work your way back
- Deep layer: 5-0 or 6-0 absorbable suture (I usually use Vicryl)
 - Horizontal mattress in the subdermal space of the lid margin, then simple continuous towards the "point" of your resection
- Skin layer: 5-0 Vicryl Rapide or monofilament non-absorbable suture
 - Figure of eight suture at lid margin
 - Simple interrupted or small cruciate sutures to close remainder of skin

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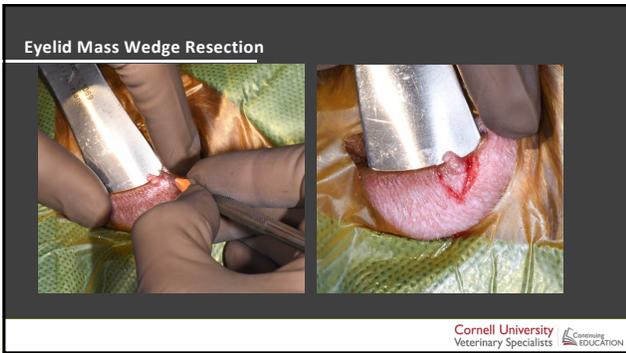
Lid masses

- Figure of eight:
 - Fine tune apposition of lid margin
 - At lid margin, needle should exit/enter at the level of the Meibomian gland openings
 - Or just outside them
 - Don't overtighten

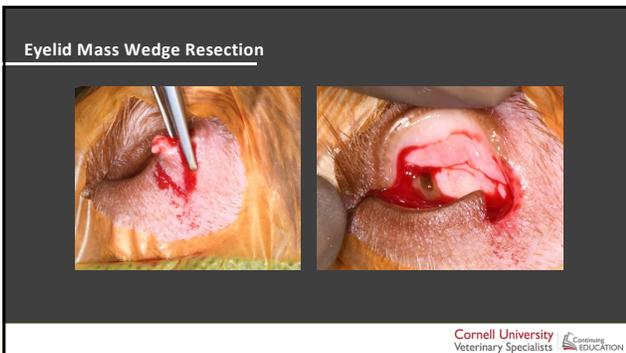
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Eyelid Mass Wedge Resection



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Eyelid Mass Wedge Resection



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Eyelid Mass Wedge Resection



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Eyelid Mass Wedge Resection

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Eyelid Masses

- Post-operative management
 - Topical antibiotic – such as NeoPolyBac
 - Oral analgesia – NSAID if possible
 - E-collar!!

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Eyelid masses

- Common mistakes
 - Just shaving off the part of the mass that is externally visible
 - Poor apposition of the lid margin on closure
 - Contact of suture with the corneal surface
 - Most common when overly large suture or suture with memory is used.

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Eyelid Lacerations

- Repair as soon as possible in most cases
 - Occasionally, if small, let heal then determine whether necessary
- Assume these are "dirty"
 - Post-op medical management is similar to lid masses, but add oral antibiotic
- Surgical repair is comparable to a wedge resection, plus:
 - May need to debride necrotic tissue – minimally, as simple as "scraping" the wound bed with a 6400 beaver or 15 blade; can excise marginal 1 mm if relatively old injury
 - Preserve as much as possible

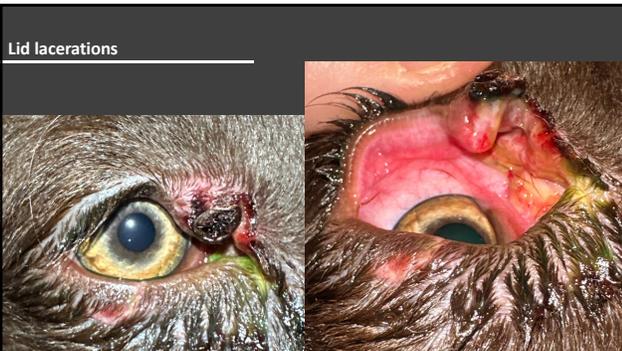
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Eyelid Lacerations



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Lid lacerations



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Agenda:

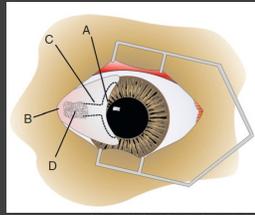
- Entropion
- Eyelid masses and lid lacerations
- Prolapsed gland of the third eyelid
- Nasolacrimal duct disease



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Cherry eye repair

- Why should it be repaired?
 - Gland contributes ~35% of tear production
 - Up to 70% in some patients
 - KCS may not occur immediately, but can be severe years down the road
 - The gland may impair blinking and cause exposure keratitis
 - The exposed gland may become dry and irritated, leading to self trauma and bleeding at home.



Small and Wrenn, Surgical procedures for the companion and the exotic animal, Veterinary ophthalmic surgery (2011 & 2014)

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Cherry eye repair

- Most common approach: Morgan Pocket Technique
 - Conjunctival mucosal pocket procedure
 - 85-90% success with an ophthalmologist (~10-15% recurrent prolapse)
- Special equipment: Think TINY! This is surgery on a thin membrane (conjunctiva)
 - Von Graefe tissue forceps or Mosquito hemostats x 2 – for exposure
 - Eyelid speculum – this will make your life easier!
 - Stevens or castroviejo tenotomy scissors
 - Colibri-style forceps 0.3mm - helps with delicate tissue handling
 - Dent or finer needle holders
 - You will create a 6-8 needle with a regular size needle driver
 - Ideally: Surgical Loupes
- Disposables:
 - 15 blade or #400 beaver blade
 - Soft absorbable suture such as Vicryl 5-0 or 6-0
 - Use 6-0 vicryl
 - Phenylephrine or dilute epinephrine
 - Sterile cotton swabs helpful for visualization/hemostasis



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Cherry eye repair

- Place lid speculum for visualization
- Von Graefe tissue forcep or Mosquito hemostats x2 at leading margin of third eyelid for exposure
- Curvilinear incision on each side of the gland, ~120-140 degrees each
- Using Stevens tenotomy (or similar delicate scissor), bluntly dissect under the conjunctiva on the side further away from the gland (a few mm is adequate) at each incision
 - This creates the conjunctival "flaps" that will "seatbelt" down the gland



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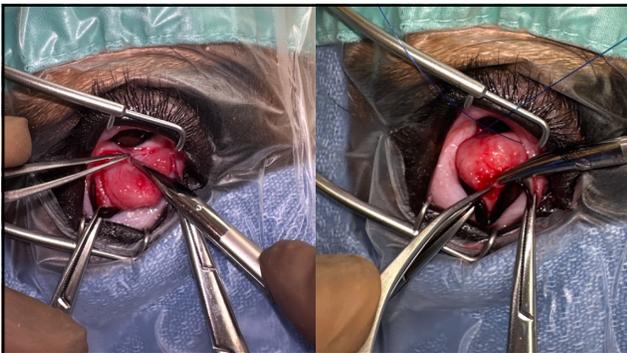
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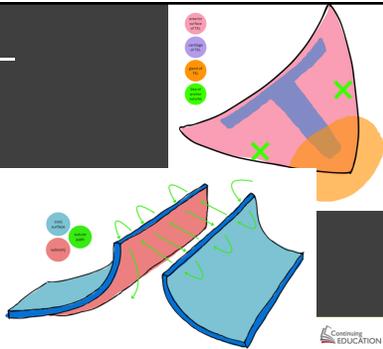
Cherry eye repair

- Surgical pearls:
 - Tiny bites!
 - This surgery requires loops – particularly in small non-bulldog breeds
 - Make sure your two incisions do NOT connect – we need to maintain a fully epithelialized tunnel at each end to prevent cyst formation
 - Anchor your knots on the anterior (palpebral surface) of the TEL – avoid contact with cornea
 - Evert the conjunctiva on each side of the incision
 - This ensures we are avoiding accidental epithelial:epithelial closures that will dehiscise as soon as sutures resorb!
 - The everted tissue also covers the suture material on the back of the TEL to prevent corneal trauma

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Cherry eye repair - closure

- Lift the hemostats/tissue forceps to visualize the anterior surface of the TEL
- Anchor suture to the conjunctiva on anterior TEL (one bite of conjunctiva and tie a knot)
- Pass needle from anterior TEL to exit at the dorsal aspect of the more marginal incision on the posterior TEL
- From there, everting suture pattern – continuous horizontal mattress
- At the end, pass needle from posterior TEL incision to anterior TEL, anchor suture to conjunctiva as you did at the start



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Cherry eye repair

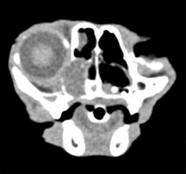
- It won't look "perfect" right away
 - Conjunctiva swells, is hyperemic
 - Warn the client it will look red and puffy
- Post-op care:
 - Topical antibiotic (NPB?)
 - Oral analgesia (NSAID?)
 - +/- SEDATION
 - E-COLLAR



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Adnexal disease

- Entropion
- Eyelid masses and lid lacerations
- Prolapsed gland of the third eyelid
- **Nasolacrimal duct disease**

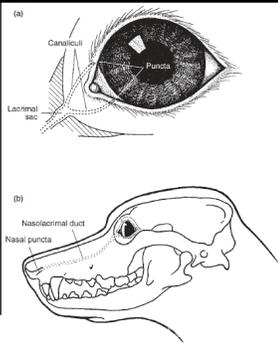


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Nasolacrimal Duct Disease

- NLD anatomy
 - Upper and lower punctae each open into a canaliculus
 - The upper and lower canaliculus meet at the sac
 - Duct travels rostrally to exit near the nares
- Signs of NLD obstruction
 - Excessive ocular discharge – often purulent, often medial
 - May even be able to visualize exudation from punctae
 - Abnormal Jones test
- Causes: congenital anomaly, dacryocystitis, foreign body, trauma with fibrosis, stenosis post-medication reaction or herpesvirus, neoplasia of the maxilla, dental disease, etc.
 - Most common: Neoplasia, foreign body/infection



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Nasolacrimal Duct Disease

- Jones testing
 - Application of fluorescein to ocular surface should result in passage of stain out the ipsilateral nares – variable timing
 - Median transit time in dogs:
 - 160 seconds if using a fluorescein strip with a drop of saline on it
 - 41 seconds if using a fluorescein solution
 - Median transit time in cats:
 - 30 seconds if using a fluorescein strip with a drop of saline on it
 - 7 seconds if using a fluorescein solution
 - Essentially not useful in brachycephalics



Because this test is satisfying to perform but unreliable...
 Nasolacrimal duct obstruction is over-diagnosed by primary care practitioners.
 I rely on clinical signs, Jones test, AND assessment at time of attempted nasolacrimal irrigation for diagnosis of obstruction.

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Nasolacrimal Duct Disease

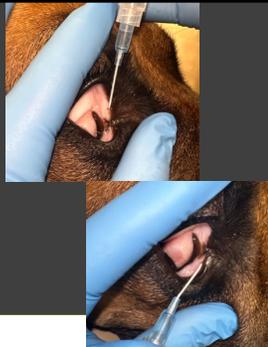
- Supplies for NLD "flush"/irrigation
 - Proparacaine, tetracaine, etc.
 - Saline (eye wash, IV fluids)
 - 3-6mL syringe
 - IV catheter: 22g (big dogs), 24g (small dogs, cats)
 - Remove needle/stylet
 - +/- Sedation
 - Good lighting
 - Good restraint
 - Ideally, loupes



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Nasolacrimal Duct Irrigation

- Rest back of your hand on the patient for stability
- Insert IVC into upper or lower puncta
 - Upper often easier
 - Follow the path of the canaliculus as you would follow the vessel when placing an IVC
- Fluid will follow path of least resistance
 - If IVC is in upper puncta, fluid will first come out lower puncta and vv
 - Occluding lower puncta with your finger will force fluid out through the distal opening at the nares (if not obstructed)
- If not flowing, pull back slightly. Do not apply significant pressure.



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Nasolacrimal Duct Disease

- After-care: most common cause of NLD obstruction is dacryocystitis +/- inciting foreign body
 - Neop/Pol/Dex suspension BID-TID x 2-3 weeks
 - Oral antibiotic trial if severe
 - Oral anti-inflammatory if patient is outwardly uncomfortable
- If persistent/recurrent, consider a second irrigation or referral for head CT scan with CT-DCRG (dacryocystorhinography)



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THANK YOU!

- Any questions?
- Follow [drwynne.evet](#) for Instagram CE
 - Message me if you have specific topics you'd like to see covered!
- Email eyes@cuvs.org with questions about cases or referrals



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