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## Palpebral Neoplasm:

### Meibomian Gland Adenoma

#### Overview:

1. Most common ophthalmic tumors and one of the most common canine tumors.
2. Extremely benign. Slow growing
3. Can suddenly enlarge due to chalazion formation and may intermittently bleed
4. Base of the tumor is IN THE LID. If you do not remove the base, it will recur.
5. Tumor of the sebaceous meibomian sweat glands that line the upper and lower eyelids
6. More prevalent in dogs with hypothyroidism
7. Almost never occur in cats.
8. Cause irritation by both mechanically contacting cornea as well as secreting unusual inflammatory lipids.

#### Goals:

1. Complete removal of the tumor to prevent recurrence
2. Maintenance of smooth eyelid margin
3. Prevention of secondary entropic, ectropion, or trichiasis

#### Therapy:

1. Surgical resection
  - a. V - lid or "House" resection - can remove up to 30% of lid margin. More on loose eyelid dogs such as bassetts, many retrievers. Be careful on tight eyelid dogs such as Shelties, Yorkies, poodles not to remove excessive lid margin.
  - b. Figure 8 suture at lid margin - start with opposing the lid margin - most important - beware of suture rub and indolent ulcers in older dogs.
  - c. Deep tarsoconjunctival sutures? AVOID PDS/MONOCRYL - can cause corneal irritation even if buried subconj. Use vicryl or nothing.
  - d. Very high success rate
2. Cryoablation and Surface Debulking
  - a. Local and sedation.
  - b. 2 freeze thaw cycles with liquid N<sub>2</sub> or N<sub>2</sub>O.
  - c. Good cosmetic appearance 3 to 4 weeks post surgery
  - d. BUT - WILL RECUR. May take 12 to 24 months, but it will grow back.
3. Large Tumors

- a. Consider cryoablation, then come back in a few months and primary resect the much smaller tumor.
- b. Blepharoplasty - sliding skin flap procedures. Will need multiple procedures and cryoepilation to achieve hairless lid margin.

## **Histiocytoma**

### Overview:

1. Typical of other dermal histiocytomas
2. Most are self limiting but can become quite large and have multiple lesions
3. Often regress after obtaining a biopsy.
4. NOT usually corticosteroid responsive on the eyelid.
5. If develops multiple lesions at other derma sites - then worry about malignant histiocytoma.

### Therapy:

1. Surgical biopsy or resection
2. if a red raised lesion on a young dogs eyelid persists for more than 14 to 21 days, biopsy the mass. If it is a histiocytoma, this often triggers regression. if it was something else, you need to know.

## **Plasmoma**

### Overview:

1. Look like histiocytomas
2. Histiocytes, plasma cells, occasional neutrophil on cytologic evaluation
3. Middle aged to older dogs Irritation - rubbing common
4. May occur at other mucocutaneous junctions.

### Therapy:

1. Surgical resection - but margins indistinct - like mast cell tumor but not as infiltrative
2. Can be partially corticosteroid responsive, but will not resolve
3. May grow to a certain size and then remain static

## **Mast Cell Tumors**

### Overview:

1. Palpebral Mast cell tumors seen mostly in small to medium sized dogs

2. Intermittent subcutaneous swelling and redness
3. Rarely ulcerative
4. Can be hard to see in darkly pigmented dogs
5. Predominately in the upper lid and temporal in location - grow around lateral canthus.
6. most ARE NOT associated with systemic mastocytosis
7. CATS - grow as small chains of lesions on upper eyelid between eye and base of ear.

Therapy:

1. Surgical resection?
  - a. margins poorly defined and hard to achieve cure
  - b. may need repeat surges over several years
  - c. fortunately, most are not life threatening
  - d. aggressive surgical resection and reconstruction +/- radiation likely the best chance for cure
2. Deionized water injection.
  - a. will definitely shrink the tumor and often clinically resolve the mass for 3 to 6 months
  - b. will not cure the tumor.
3. Corticosteroids? Minimal response for eyelid mast cell tumors
- 4, Radiation with ocular shielding.

## Squamous Cell Carcinomas

Overview

1. Predominately white cats
2. RARE on the eyelids of dogs - Occurs on cornea and conjunctiva of dogs with chronic inflammation such as KCS.
3. Aggressive tumors
4. Often grow slowly for many months and sometimes years, then suddenly grow quickly
5. Rapid growth associated with poorer prognosis.
6. Appearance
  - Flat red hairless margin
  - Raised rough tissue
  - Erosive loss of skin

## Treatment

1. AGGRESSIVE surgical excision best bet
  - a. Must get early
  - b. Lip to lid for lower eyelid
  - c. . Grows with tentacles under skin and into periosteum of maxilla and frontal bones.
  - d. Once in bone, very difficult to resolve
2. Cryotherapy
  - a. Quite responsive, but rarely will resolve - will shrink tumor
  - b. Excellent for early, non-erosive lesions on eyelid margins and nose.
  - c. NOT useful for large dense tumors.
  - d. can repeat therapy multiple times. Buy patient time. Must get early
3. Radiation Therapy
  - a. Helpful, especially for tumors that have invaded boney structures.
  - b. But still difficult to achieve a cure
  - c. May have extensive collateral damage to the globe.
3. Local Anti-metabolite Therapy
  - a. Injectable carboplatinum in oil - moderate response, but less response in cats than in horses
  - b. Topical 5-fluorouracil for canine conjunctival SCC works well.

## Dermal melanomas

### Overview

1. Extremely benign
2. Not common - most heavily pigments eyelid tumors are pigmented meibomian gland tumors
3. Must distinguish from conjunctival melanomas which are VERY AGGRESSIVE.

Treatment - Same as meibomian gland adenomas

## Conjunctival/Corneal/Limbal Neoplasms

## Hemangioma/Hemangiosarcoma

### Overview

1. Occur predominately in english setters, english spaniels, and spotted bird dog breeds
2. Often read out as malignant, but not metastatic.
3. Like to recur, and may occur bilaterally
4. Most often occur on leading edge of third eyelid, occasionally at temporal limbal conjunctiva and cornea.
5. Main complaint is often acute bleeding from the eye.

#### Treatment

1. Surgical resection - get good margin. Easy to detect early as they are often visible and bleed early.
2. Watch for recurrence or new lesions in other eye

### **Papilloma**

#### Overview

1. Small, pedunculated wart like lesions on conjunctiva
2. Small, slow growing, minimal vascularizations
3. Very benign

Treatment - Surgical resection - topical and snip. Do not suture.

### **Conjunctival Melanoma**

#### Overview

1. Rapidly growing, highly malignant tumors
2. Identical behavior to oral melanomas
3. Start on the conjunctival side and can extend into the dermis.

Treatment - Surgical resection - topical and snip. Do not suture.

1. Wide surgical resection
2. Remove local submand LN and look for metastasis
3. Follow up with chemotherapy

### **Limbal Melanomas**

#### Overview

1. Usually occur at dorsal limbus as a raised dark area that slowly grows over 6 to 18 months
2. Breed predilection includes Retrievers, German Shepherds, Rottweilers
3. Benign, but can eventually cause distortion of globe, loss of vision, and glaucoma.

4. Less common in cats. Can be more aggressive in cats.

#### Treatment -

1. Surgical debulking of the mass and diode laser ablation of the base. Highly successful (> 90%) in resolving small to medium melanomas that do not penetrate into the globe (enter the uveal tract)Wide surgical resection
2. Surgical Debulking and cryotherapy. Not as successful as laser therapy and causes much more secondary damage to the globe. However, better for deeper or more extensive tumors.
3. Corneal-Scleral transplant. Larger tumors or tumors that recur after laser or cryo therapy are best treated with complete surgical resection and reconstruction of the globe. Will cause greater scarring and greater potential for decreased vision
4. Enucleation. For advanced tumors or where secondary changes such as glaucoma have occurred.

### **Intraocular Tumors**

#### **Canine Uveal Melanomas**

##### Overview

1. Benign, heavily pigmented slow growing solitary masses in most dogs. Often large before discovered due to the dark color of the canine iris. Can also occur in the ciliary body where they usually have caused glaucoma before they are detected.
2. Can occur very young in life, less than 1 year of age, in Labs, Std Poodles, and German Shepherds. Occurs as adults in same breeds and in Rotties and Golden.
3. Benign, but can eventually cause distortion of globe, loss of vision, and glaucoma.
4. EXFOLIATIVE MELANOMAS: Golden retrievers often have a unique type of uveal melanoma where the tumor is less distinct, growing as loose pigment cells with many free floating cells. Still benign but harder to control. Similar to but clinically different than Golden uveitis which can also be associated with pigment dispersion in the anterior chamber.

#### Treatment -

1. Sector Iridectomy. For lesions up to 5 clock hours, primary resection, occasionally with laser ablation of the base of the mass, can be curative. Especially beneficial for thicker tumors where complete diode laser penetration is difficult.
2. Diode laser ablation. Highly successful for smaller, flatter tumors. Laser surgery may be effective both through direct killing of melanoma cells as well as triggering an immune response to the tumor cells.
3. Enucleation. For advanced tumors or globes with secondary glaucoma

## Canine Ciliary Body Adenomas

### Overview

1. Mostly benign, but more rapid growth than melanomas.
2. Grow in front of and behind lens - often show up as pink tissue peeking through the pupil.
3. No apparent breed predilection
4. Rule Outs - LSA, Metastatic carcinoma, Inflammatory nodule.

### Treatment -

1. Surgical resection via a pars plana scleral approach possible in some patients. May not eliminate tumor, but can debulk mass and buy the patient 12 to 24 months before secondary glaucoma occurs.
2. Diode laser ablation. The tumors are often not pigmented. But heme in RBCs in tumor will partially absorb laser energy and can achieve partial shrinkage of tumor in many cases.
3. Enucleation. For advanced tumors or globes with secondary glaucoma. Since the tumors are benign, often wait until glaucoma develops before enucleation is pursued.

## Feline Iris Melanomas

### Overview

1. Orange cats predisposed
2. Many cats fall into one of two age ranges: < 4 yrs of age cats and > 10 yr of age cats
3. Often start out as a single freckle, then grow as a broken ring of pigment islands around the base of the iris. Will appear flat and look simply like a change in color.
4. SLOW growing over 2 to 3 years. Tumors grow, freckles do not.
5. Eventually grow through out the entire iris and into the iridocorneal angle causing glaucoma and loss of the globe.
6. Benign or Malignant????? There is no question that unlike canine melanomas, feline melanomas can be metastatic and fatal. Original literature and some recent histopathologic (not clinical) papers suggest that the tumors are malignant. HOWEVER, clinically, most are not metastatic and are globe threatening but not necessarily life threaten.
7. The problem is distinguishing between the potentially malignant tumors and the more benign tumors. Histopathologic characteristics DO NOT CORRELATE well with CLINICAL progression, EXCEPT mitotic index. Since mitotic index is essentially growth rate, we worry about more rapidly growing tumors. Also, tumors with a loose less distinct surface are of greater concern.

8. When do the malignant tumors metastasize? The limited data available suggests early as removal of the eye DOES NOT STATISTICALLY increase survival rate of the cat. Mostly benign, but more rapid growth than melanomas.

#### Treatment -

1. Do nothing. Since the tumor is typically slow growing, simply monitoring the tumor and monitoring for glaucoma is a reasonable therapy in cats older than 15 yrs of age.
2. Enucleation of the eye.
  - a. Definitely for any globe with glaucoma
  - b. Logic suggests that early enucleation decreases the potential for metastasis. However, there is no clinical data that demonstrate that early removal reduces the potential for metastasis. Plus, the actual rate of metastasis appears to be much lower than originally reported 20 years ago.
3. Laser ablation
  - a. Diode laser ablation of iris surface lesions is helpful. 810nm wavelength of diode energy preferentially absorbed by melanin
  - b. Useful for tumors involving 50% or less of the iris surface, although may slow the growth of more extensive tumors
  - c. Side effects: iris thinning, dyscoria and mydriasis due to laser damage to underlying sphincter muscle, darker more abnormal appearing iris. The original "pigment" cells (yellow, green, blue) of the iris are gone. Simply killing the melanoma cells simply results in exposure of deep, darkly pigmented iris stroma. Pupil dilation can slightly reduce near vision.
  - d. Immune response? Lasering one area of an iris melanoma can cause atrophy of other areas of the tumor in the iris that did not directly receive laser energy.
4. Chemotherapy?
  1. Most chemotherapeutic agents have minimal to no effect on the growth rate of iris melanoma.
  2. Cimetidine? Cimetidine can slow the growth of certain melanomas in humans and horses. Unknown if beneficial in cats
5. Radiation Therapy?