EPISCLERAL ONCHOCERCIASIS IN 19 DOGS

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COMPARATIVE OCULAR PATHOLOGY LAB OF WISCONSIN
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PURPOSE: RETROSPECTIVE STUDY OF 19 DOGS

- To describe diagnostic histologic appearance
- To describe regional and breed distribution
- To characterize clinical signs and response to therapy
- Provide a forum to share clinical experiences
METHODS

- Database search of 26,861 clinical submissions
- Identification of 19 cases with definitive or likely onchocerciasis
- Review of histologic slides
- Review of submission records
- Survey of submitting ophthalmologists: 15/19 returned either records and/or completed surveys
- Contact with referring veterinarians when possible
CLINICAL PRESENTATION

- Chronic inflammatory lesions unresponsive to antibiotics and steroid therapy

- Symptoms of 3 weeks to 1 year, average 4 months

- 17/19 cases: single or multiple masses in the conjunctiva, limbal or retrobulbar episclera

ALL clinical photos, courtesy of Dr. Anastasia Komnenou. School of Veterinary Medicine, Aristotle University of Thessaloniki, Greece
CLINICAL PRESENTATION

- Non-specific symptoms: painful swollen eye, corneal edema, keratitis, chemosis, conjunctival swelling with mucus discharge.

- +/- Parasites seen clinically:
  - Vermiform, stringy tissue
  - Parasites seen at surgery and submitted in biopsy jar.
  - Parasite in conjunctival necrosis.
HISTOLOGIC FEATURES

- 6 globes, 12 tissue nodules, 1 worm

- Nodular tissue sections from 2 mm to 2 cm
HISTOLOGIC FEATURES

- 14 cases, with definitive *Onchocerca sp* diagnosis

- Morphologic features: low, rounded, circumferential external ridges and internal striae.

- *Thelazia* sp do not have external ridges
PRESUMPTIVE DIAGNOSES 5 CASES

- Eosinophilic
- Granulomatous inflammation in periocular tissues
- Geographic location
- Clinician interpretation

- Quiet globe beyond nodules
- Greater inflammatory response to dead worms
PATENT INFECTIONS

- 7 of 19 contain gravid adult females
- L3 infective stage

Live microfilaria in paired uteri
SUBCLINICAL CASES

- Enucleation for other reasons
- Parasites found incidentally
- Minimal inflammation
- Other subclinical cases in endemic regions?
THE LIFE OF THE DOGS

Signalment
- 12 males and 7 females
- Average 5 years (range, 1-11)
- 8 OS, 5OD, 4OU, 2 unknown

Heartworm Prophylaxis?
- 13 responses
- 1 dog on therapy

Hobbies:
- Contact with other animals: ostriches, goats, horses, deer, cows, other dogs
- Been to several rodeos
Herding dogs: 9/19
Outdoor lifestyle? Ivermectin avoidance?
RECENT PHENOMENON

Cases diagnosed by year
18/19 after 2004
TIGHT GEOGRAPHIC DISTRIBUTION

Previous reports

Diagnosed by other labs

COPLOW cases
GREEK DIAGNOSIS AND TREATMENT

- **Diagnosis**: acute and chronic forms
  - Clinical signs
  - Microfilaria in skin
  - Circulating eosinophilia (40%)

- **Day 1**:
  - Surgical excision of cysts/nodules
  - Oral prednisone
  - Systemic doxycycline*

- **Days 9 and 10**:
  - Melarsomine, adulticide
  - Intense pruritus and conjunctival swelling

- **Day 30**
  - Ivermectin, microfilaricide
RESPONSE TO THERAPY in US:

- Treatment details from 12/19
- Variations on Greek protocol
- 2 dogs with repeat excisions
- No news is good news?
- Don’t return to ophthalmologist
- No reports of pruritus and edema
- Shock-like symptoms following melarsomine treatment
SPECIATION IN US DOGS UNCLEAR
PARASITOLOGY MORE ADVANCED IN EUROPE

- 2000: Eberhart ML. Experimental infection of common domestic Onchocerca sp.
  - 15 month follow-up
  - Monthly ocular and skin snip exams
  - Full post-mortem exam
  - No clinical signs, microfilaria or adults found

- Onchocerca lapi: proposed species name in Europe

- Doxycycline kills wolbachia, a rickettsial endosymbiont of Onchocerca

- Doxycycline and ivermectin may act synergistically to kill adult Dirofilaria immitis
NEXT STEPS TO STUDY SPECIATION AND LIFE CYCLE

- Presence of microfilaria in skin?

- Bank tissues for molecular work

- Skin snip procedure:
  - 1mm circular skin snips from canthus, ears, umbilicus
  - Float in saline, watch for microfilaria
  - Save microfilaria, skin, and or nodules in 30-50% alcohol for up to 1 year
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- Mark Eberhard, CDC

- John McCall, Professor Emeritus, University of Georgia
QUESTIONS?
COMMENTS?
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DOXYCYCLINE THERAPY


- Experimental heartworm infections treated with combinations of ivermectin, doxycycline, and melarsomine.
  - 93% reduction of adult worm burden with all three.
  - 78% reduction with Ivermectin and Doxycycline alone.
AVAILABLE TREATMENT DETAILS IN COPLOW DOGS (12/19)

- Enucleation: 6
- Surgical debridement: 12
- Ivermectin, oral, injectible or both: 6
- Melarsomine (Immiticide®) IM x 2, 1 month after dx: 5
- Doxycycline: 2
- Pyrantel Pamoate (presumably w/ Ivermectin in HeartGuard+): 2
- Steroids: 4 prednisone, 1 intralesional Depo-Medrol
- Cryoablation: 2

Transmission of infectious stage of *Onchocerca volvulus* (human origin), *Onchocerca linealis* (cattle origin), *Onchocerca cervicalis* (horse origin).
REFERENCES

TIGHT GEOGRAPHIC DISTRIBUTION

COPLOW Cases
SURVEY QUESTIONS:

- Duration of symptoms before and after diagnosis
- Any adverse reactions to therapy?
- Heartworm prophylaxis?
- Any other clinical signs of onchocerciasis?
- Lifestyle: outdoor, indoor/outdoor, indoor, hunting, swimming, hiking, etc…