The Laboratory Dog

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Disclaimer

- This is not an ACLAM sanctioned presentation
- All information is deemed reliable and correct
  - No warranty for accuracy
- No information presented is known to be specifically included in the ACLAM Board Certification Exam

Genus and species?

- Canis familiaris

Research Uses

- Pharmacology
- Toxicology
- Surgical models
- Dental studies
- Many others

Research Uses
source classifications

- Class A?
- Class B?

source classifications

- Class A - Purpose bred
- Class B - Random source

Dog space

- Floor space?
  - \((\text{Length} + 6 \text{ in.})^2 / 144\)
  - Length: nose tip to tail base
- Height?
  - 6 in. taller than head of tallest standing dog
- Exercise if what conditions not met?
  - Single: < 2X floor space
  - Group: < 100% required space each
- Exercise Exemption?
  - By vet for health reasons, 30 day review unless permanent.

Diseases

Diagnosis?

Calcium oxalate crystals

- “Maltese cross”
- Can be normal
- With renal failure- suggests ethylene glycol toxicosis

Repro stuff

- Cycle?
  - Monoestrus
- Fertilization can occur how late?
  - 8 days after coitus
- How long oocytes viable?
  - 12-24 hours after ovulation
- Placentation?
  - Endotheliochorial
- Gestation length?
  - 59-63 days
Diseases

Diagnosis?

Diseases

Diagnosis?

Giant Kidney Worm

- *Dioctophyme renale*
- Renal pelvis

Diagnosis?

Diseases

Diagnosis?
**Juvenile Polyarteritis Syndrome (JPS)**
- Beagles, other breeds occasionally
- Fever, painful neck
- Systemic necrotizing vasculitis
- Hereditary? Autoimmune mediated
- Remissions and relapses
- Steroid responsive

**Diagnosis?**

**Blastomycosis**
- *Blastomyces dermatitidis*
- Inhaled from environment
- Other systemic fungal diseases?

**Histoplasma capsulatum**

**Cryptococcus neoformans**

**Coccidioides immitus**
**Diseases**

Test for?

- Brucellosis
  - *Brucella canis*
  - Epididymitis, orchitis, endometritis, placentitis, abortions, infertility
  - Zoonotic
  - *B. abortus, B. melitensis, B. suis*
  - Reportable disease

**Diseases**

Diagnosis?

- Interdigital cyst
  - Chronic inflammatory lesion (not cyst)
  - “sterile pyogranuloma complex”
  - German shepherds, beagles
  - Usually 3rd & 4th interdigital spaces
  - Sterile- steroids, surgery
  - JAALAS 44(4): 2005 p17-21

**Diseases**

Caused by?

- Kennel Cough Complex

**Kennel Cough**

- *Bordetella bronchiseptica*
- Canine parainfluenza virus
- Canine adenovirus 1 & 2
- Canine herpesvirus, reovirus, mycoplasma
Diseases

**Tapeworm**
- *Dipylidium caninum*

**Mast cell tumor**
- Most common skin tumor
- Grades I- III
- Gastric ulcers b/c of histamine
- Potentially malignant
- Toluidine blue- stains cytoplasmic granules
- Surgical excision

Diagnosis?

**Tapeworm**
- *Taenia*

Diagnosis?
**Breed and Model?**

- Grey collie
- Cyclic neutropenia/hematopoiesis
- Grey collie syndrome

**Diseases**

- **Heartworms**
  - *Dirofilaria immitus* vs. *Dipetalonema reconditum*
  - *Wolbachia*
    - Obligate, intracellular, gram-negative bacteria found in most filarial nematodes
    - Order Rickettsiales
    - Contribute to pulmonary and renal inflammation through the *Wolbachia* surface protein (WSP)
    - Suppressing *Wolbachia* with doxycycline prior to adulticide therapy may reduce the gross pulmonary pathology b/c of thromboembolic shower of dead worm fragments.

- **Papillomatosis**
  - Canine oral papillomatosis
  - Papillomavirus
  - Mouth, nostrils, eyelids
  - Rarely, can progress to squamous cell carcinoma
  - Immature immune system, usually
    - Puppies or young dogs primarily
**Ehrlichiosis**

- *Ehrlichia canis*

- Vector?

**Vector**

- Brown dog tick

- *Rhipicephalus sanguineus*

**? platys**

- Previously *Ehrlichia platys*

- Changed to *Anaplasma platys*

- Same vector as *E. canis*
**Diseases**

**"Cherry Eye"**
- Hyperplasia or prolapse of nictitating membrane (3rd eyelid) gland
- Not congenital, but breed disposition (beagles)
- Steroid treatment?
- Usually surgical excision

**Diagnosis?**

**Giardia**
- *Giardia duodenalis* (lamblia)
- Direct life cycle
- pH change from stomach to duodenum- excyst
- Direct fecal- trophozoites
- Zinc sulfate float- cysts

**Diagnosis?**

**Bleeding Disorders**
- Hemophilia A- deficiency in ?
  - Factor VIII deficiency
- Hemophilia B- deficiency in ?
  - Factor IX deficiency
- Von Willebrand disease (vWD)- deficiency in?
  - vWD- Von Willebrand factor deficiency
- Breed association?
  - Doberman Pinschers

**Bleeding Disorders**
- Alexander’s disease/ proconvertin disease- deficiency in ?
  - Factor VII deficiency
- Breed association?
  - Beagles*, Alaskan Klee Kai, Alaskan Malamutes, other and mixed breeds

http://en.wikipedia.org/wiki/Alaskan_Klee_Kai
Coagulation

Diseases

Spirocerca lupi
- Nodules in esophagus, stomach, aorta
- Hypertrophic osteopathy
- Esophageal sarcoma
- Aortic aneurism
- Spondylitis of posterior thoracic vertebrae

Breed and Model?

Breed and Model
- Bedlington terrier
- Copper storage disease/ copper toxicosis- Wilson’s Disease

Breed and Model?
- Rat strain model?
- Fish model?
**Copper storage disease**
- Long Evans Cinnamon Rat
- White perch (*Morones americana*)

**Fluke**
- *Paragonimus kellicotti*

**Lyme Disease**
- *Borrelia burgdorferi*
  - Zoonotic
  - Test- IFA or ELISA (vaccine- positive)
  - Treatment- doxycycline
- Vector?
- Reservoir?

**Diseases**
- Lameness (shifting)
- Fever
- Weight loss
- Lymphadenopathy
Lyme Disease

- deer tick (Ixodes)
- White-footed deer mouse – Peromyscus leucopus
- Other tick-borne diseases?

Tick-borne diseases

- RMSF (Rickettsia rickettsii)
- Babesia canis
- Mycoplasma haemocanis
  – formerly Hemobartonella canis
- Hepatozoon canis
- Ehrlichia, Lyme disease
  Retrospective of lab dog serologic reactions: JAALAS 47(5): 2008, p23-8

Diseases

- Whipworms
  - Trichuris vulpis
  - Direct life cycle
  - Intermittent release of eggs
  - Eggs survive in environment (years)
  - Resistant to disinfection
  - Dessication or incineration

Diseases

Diagnosis?

**Leptospirosis**

- *Leptospira interrogans*
- Serovars: canicola, icterohemorrhagiae, grippotyphosa, pomona, bratislava
- Zoonotic
- Vaccines now available for all serovars but bratislava

**Diseases**

- Canine Distemper Virus
  - Paramyxovirus
  - Genus Morbillivirus
  - INIB & ICIB
    - Tongue, brain, trachea, bladder, conjunctiva
  - Neurologic signs - demyelination
  - Fluorescent Ab - mm or conjunctiva
  - Other Morbilliviruses?

**Canine Distemper Virus**

- Measles
- Rinderpest

**Diseases**

- Diagnosis?
**Babesia**
- *Babesia canis*
- Protozoan
- Hemolytic anemia
- Vector - brown dog tick
- Other Babesia - B. gibsoni

**Lipoma**
- Subcutaneous
- Encapsulated
- Older, overweight females
- Don’t recur after excision
- Surgical removal if affecting ambulation

**Lungworm**
- *Oslerus osleri*
- Previously *Filaroides osleri*
- Metastrongyle
- Tracheal irritation, persistent coughing
- Bronchoscopy, tracheal wash

**Diseases**

**Diagnosis?**
Transmissible Venereal Tumor (TVT)

- Transmitted by coitus
- Genital nodules- also skin, lips, nasal mucosa
- Can affect males or females
- Metastasis rare
- Remove from breeding program
- Vincristine- remission and cure 90%

Diseases

Strep

- Streptococcus
- *S. zooepidemicus*
- Bull’s eye lesion
- Strep Lancefield group C

Diagnosis?


Diseases

- Young puppy- hemorrhage
- Older puppy- neuro signs
- Adult- reproductive dz
- Diagnosis?
Canine Herpesvirus
- Latent infection - recrudescence
- Venereal transmission
  - Or birth canal - puppies
- “Turkey egg” kidneys
- Basophilic INIB

Dermatosporaxis
- Stretchy skin
- Ehlers Danlos
- Collagen disease
- Dogs, cats, mink

Rabies virus
- 3 stages
  - Prodromal
  - Furious
  - Paralytic
- Incubation 1 week - 1 year
- Definitive Dx: Fl. Ab - virus in Negri bodies of hippocampal cells

Diagnosis?
**Coccidia**
- *Cytoisospora canis*
  - *C. ohioensis*
  - *C. burrowsi*
  - *C. neorivolta*
- Direct or indirect transmission
- Sporulates in environment to infective stage

**Diseases**

**Canine Parvovirus**
- ≤ 500-2000 WBC/ul
- Hypothermia, icterus, DIC
- 6-20 weeks old
- Affinity for + cells
  - Villus atrophy
  - Crypt necrosis
  - Bone marrow, lymphoid cells
- Fecal ELISA from CITE
- Rottweilers and Dobermans

**Ascarids**
- *Toxocara canis*
- *Toxascaris leonina*
- Visceral larval migrans- pneumonia
- Potbellied puppy, intussusception
- Transplacental and transmammary migration
- Infective stage- L3
Breed and Model?

- Golden retriever
- Muscular Dystrophy (Duchenne)
  - X linked recessive
  - Absence of dystrophin muscle protein

Diseases

- Sarcoptes scabiei var. canis
  - Intensely pruritic
  - Survive 1-3 weeks off host
  - Zoonotic - infects cats and humans
  - Can get negative scrapes - therapeutic trial
  - Other mite?
  - Demodicosis
    - Demodex canis
    - Hair follicles
    - Commensal/normal fauna
    - Localized or generalized
      - Localized usually < 18 months and resolves w/o treatment
      - Generalized usually secondary - endocrine disorder or immunosuppression

Mange

- Other mite?

Disorders
Lick Granuloma

- Acral lick granuloma
- Release of endorphins
- Behavior modification, exercise, toys
- Anti-anxiety, topicals, opioid antagonists

Pressure Sore

- Pressure sore (decubital ulcer)
- Extended recumbency
- Pressure from a cast
- Often second-intention healing by granulation tissue

Elbow Hygroma

- Most often over olecranon
- Tuber calcis, greater trochanter, stifle
- Usually giant and large breeds
- Unilateral or bilateral
- Fluid filled, painless
- Relieve point pressure (bandage), pad cage, drain/aspirate

Disorders

Diagnosis?
**Histiocytoma**
- Benign
- Monocyte-macrophage cells
- “button tumors”
- High mitotic index
- Usually spontaneously regress in < 3 months

**Hookworms**
- *Ancylostoma caninum*
  - *A. braziliense*
  - *Uncinara stenocephala*
- Anemia, melena
- Transmammary migration, some transplacental
- Infective stage- L3
- Adult hookworm- 0.02- 0.2ml blood

**Breed and Model**
- Malteagle
- Glycogen Storage Disease

**Inherited disease? Breed association?**

**Hookworms**
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**Breed and Model**
- Malteagle
- Glycogen Storage Disease

**Inherited disease? Breed association?**
**PK**

- Phosphofructokinase deficiency
  - Glycogen storage disease type VII
- Cocker spaniel
- English Springer spaniel
- Whippet?
- Other disease possibility?

**PK**

- Pyruvate kinase deficiency
- RBC’s into echinocytes
- Enzyme-deficient hemolytic anemia
- Beagles, Basenji, Cairn Terrier, West Highland White Terrier

**Diseases**

**Ringworm**

- *Microsporum canis*
- *M. gypseum*
- *Trichophyton mentagrophytes*
- Sabourand’s medium or dermatophyte test medium (DTM)
- *M. canis* may fluoresce- Wood’s lamp

**Diseases**

**Polydactyly**

**Diseases**

**Diagnosis?**
Injury Related to Environmental Enrichment in a Dog: Gastric Foreign Body
JAALAS 48(1): 2009, p76-78

- Dog BCS: JAALAS 43(3): 2004 p34- 7