VET 433B Diarrhea

Diagnostic Approach to Diarrhea

- Small vs large vs mixed bowel
- Acute vs chronic (>3 weeks)
- GI vs Extra-GI

Questions to Ask Owners

- Small vs Large Bowel or both
    - Obviously owners will not know the difference but ask questions that give you the answer
- Purina Fecal Score
- Chronicity
- Progression
- Severity (CIBDAI or CCECAI)
- Other signs
    - Appetite
    - Weight loss
    - Vomiting/regurgitation
- Triggers
    - Dietary indiscretion
    - Foreign material
    - Stress
- Diet history
    - Raw
    - Fish
- Environmental/Travel
- Parasite prevention
- Vaccination
- Pruritis

Differentiating between Small and Large Bowel Diarrhea

	Small Bowel	**Large Bowel**
Frequency	Normal to mild-moderately increased	Mod to markedly increased Urgency
Volume	Normal	Small
Tenesmus	No	Yes
Mucous	No	Yes

Blood	Melena	Hematochezia

Weight loss and vomiting are more consistent with small bowel diarrhea

Physical Examination

- Temperature
- Abdominal palpation
- Body condition score
- Muscle condition score
- Rectal examination

Acute Diarrhea

Causes

- Dietary indiscretion
- Foreign body > intussusception
- Stress colitis
- Infectious
    - Parasitic – roundworms, hookworms, coccidia, giardia, cryptosporidium, whipworms (large bowel), less often tapeworms
    - Viral – parvovirus/panleukopenia, distemper
    - Bacterial (less common) – Salmonella, Campylobacter, Neorickettsia helminthoeca
- Antibiotics/Meds
    - Omeprazole
    - Chemotherapy
    - NSAIDS
- Acute pancreatitis

Diagnostic Work-Up

- CBC/Chem/UA
- Abdominal radiographs
- Abdominal ultrasound
- Fecal examination
    - Float and centrifugation
    - Comprehensive PCR testing (Antech KeyScreen)
    - Giardia ELISA
    - Cryptosporidium, Giardia DFA

- Parvovirus/Panleukopenia SNAP (ELISA antigen)

Management

- Often self-limiting
- Supportive care
- Highly digestible diet
- Fiber (psyllium)
- De-worming
    - Fenbendazole 50mg/kg x3-5 days
    - Drontal plus (praziquantel, pyrantel, febantel)
- Avoid antimicrobials
    - No clinical benefit
    - Increase dysbiosis and resistance
    - Only use if systemic illness or sepsis is present (fever, left shift)

Acute Hemorrhagic Diarrhea Syndrome

- Sudden onset of bloody diarrhea +/- vomiting, anorexia, and lethargy
- Unknown cause
- Necrotizing enterocolitis associated with *Clostridium perfringens* and release of netF toxin
- Majority do not need antibiotics
- Treat supportively

Giardia duodenalis

- Protozoal parasite
- Often asymptomatic > do not treat unless zoonotic assemblage (A and B)
- Small bowel diarrhea
- Opportunistic infection, treat underlying disease
- Diagnosis
    - Fecal float + centrifugation (cysts) and ELISA or PCR or DFA
- Treatment
    - Fenbendazole 50mg/kg q 24h x 5 days
    - Drontal Plus x 3 days
    - Bathe, decontaminate environment
    - Goals: resolve clinical signs
    - ELISA and PCR can remain positive after treatment

Tritrichomonas foetus/blagburni

- Protozoal parasite
- Young, pure-bred, multi-cat household colony
- Can be subclinical
- Large bowel diarrhea (malodorous, fetid, cowpie)
- Fresh sample, PCR (with fecal loop) > fecal culture
- Concurrent giardia is common
- Treatment
    - Ronidazole 30mg/kg q 24h x 14 days
        - Difficult to obtain, risk of neurotoxicity and unsuccessful in 1/3 of cases
        - Do not use in pregnant cats or kittens <12 weeks
    - Psyllium, probiotic, diet change

Salmon Poisoning Disease

- Northwestern US
- Ingestion of raw or undercooked fish
- Fish carries fluke (*Nanophyetus salmincola*) which inoculates *Neorickettsia helminthoeca*
- Clinical features
    - Fever
    - GI Signs (Large bowel diarrhea)
    - Lymphadenopathy
- CBC
    - Thrombocytopenia
- Chem
    - Hypoalbuminemia
- Diagnosis
    - LN FNA, PCR (LN or blood), Fecal float and sedimentation for the fluke
- Tx
    - Doxycycline 5mg/kg po q 12h > 7 days
    - Praziquantel for the fluke
- Fatal if left untreated

Fecal Cultures

- Enteropathogenic bacteria
    - Salmonella, Campylobacter, E. coli, Clostridum perfringens or difficile
    - Detection does not = infection
- Consider if…

- Acute illness
- Raw food exposure
- Sepsis
- Concern for zoonosis or if other dogs in the environment are also affected
- Blood/LN cultures also positive

<u>Chronic Diarrhea</u> (>3 weeks)

Diagnostic Work-Up

- CBC/Chem/UA
  - Rule out extra-GI disease
  - Determine if PLE
- Fecal examination
  - +/- histoplasma, Pythium testing
  - Rectal scrape if large bowel
- Abdominal ultrasound
- B12/Folate, TLI for EPI +/- cPL or fPL for pancreatitis
- Total T4 (cats)
- Cortisol/ACTH stim for hypoadrenocorticism
- +/- GI endoscopy and biopsies

Food-Responsive Enteropathy

- 70-80% of dogs will respond to diet change
- Often young dogs but can occur at any age
- Mostly large bowel diarrhea
- Less severe clinical signs
- +/- Puritis/otitis
- Treatment
  - Diet trial, improvement in <2 weeks
  - If first diet doesn't work, try another one
  - Eliminate treats and medications with flavoring
- Choosing a diet
  - Novel or hydrolyzed protein
    - Especially if cutaneous signs are present
    - Hydrolyzed is usually preferred
  - Low fat (<20% ME)
    - Pancreatitis, delayed motility, lymphangiectasia
  - Home-cooked

        - Address co-morbidities
        - Palatability
        - Ultra-low fat (<10% ME)
    - Fiber-enriched or just adding psyllium
        - Large bowel component

Immunosuppressant-responsive Enteropathy

- Idiopathic inflammatory bowel disease
- Histologic diagnosis + inadequate response to diet
- Typically also on diet +/- probiotics
- Prednisone/Prednisolone of 1-2 mg/kg/day or less
    - Taper ASAP due to adverse effects (catabolic, prothrombotic, lipidemic)
- Budesonide
    - More targeted to GI
- Steroid alternatives
    - Cyclosporine
    - Chlorambucil

Vitamin supplementation

- Cobalamin (B12)
    - Indicates malabsorption in the ileum, severely inadequate intake, dysbiosis or EPI
    - Supplement when Cobalamin is <400 ng/L
    - Oral is as effective as SQ
- Calcium if hypocalcemia
- Magnesium if hypomagnesemia
- Folate
    - Indicates malabsorption at the jejunum
    - Benefit of supplementation is less known
- Vitamin D
    - Benefit is less known

Antibiotic Responsive Enteropathy

- Outdated
- Avoid antimicrobials
- Promote favorable microbiome with diet, pre/probiotics, fecal transplantation
    - More research is needed

Pathogenesis of Chronic Inflammatory Enteropathy

- Multifactorial
- Loss of tolerance to dietary and microbial components in genetically predisposed hosts
- Breed predispositions
- Histology
    - lymphoplasmacytic inflammation
    - Eosinophilic enteritis – parasitic, allergic, immune
    - Neutrophilic or histiocytic
        - Consider bacterial or other infection
    - +/- lacteal dilation

Histocytic Ulcerative Colitis

- Boxers, French Bulldogs
- Large Bowel Diarrhea
- Cause
    - Adherent and invasive *E. coli*
- Diagnosis
    - Colonic biopsies; histiocytic colitis, PAS + macrophages
    - Fluorescent in-situ hybridization (FISH): intramucosal E. coli
- Treatment
    - Enrofloxacin 10mg/kg po q 24h x 8 weeks or other antibiotic based on susceptibility and macrophage penetration
- Treatment failure
    - MDR
    - Immunosuppression

Protein-Losing Enteropathy

- Labs
    - Hypoalbuminemia
    - Low to normal globulin
    - Low to normal cholesterol
- Causes
    - Chronic inflammatory enteropathy
    - Lymphangiectasia
    - Intestinal ulceration
    - Hypoadrenocorticism
    - Exocrine pancreatic insufficiency
    - Foreign body
    - Intussusception
    - Infectious enteritis: endoparasitism, fungal, viral

    - Neoplasia
    - Pancreatitis
- Breed predisposition
    - Dogs >> cats
        - German shepherd
        - Soft coated wheaten terriers (PLE + PLN)
        - Yorkshire terrier
        - Basenji
        - Norwegian Lundehund
        - Rottweiler
        - Chinese Shar-pei
    - Workup is the same as for a chronic enteropathy
- Management
    - Many are diet-responsive, especially with a fat-restricted diet
    - Nutrition via tube
    - Address cavitary effusions
    - Consider thromboprophylaxis
    - Caution with crystalloid fluids

Lymphangiectasia

- Pathogenic dilated lacteals in villi, inflammation, crypt and villous damage
- Protein, lipid-laden lymph loss into the intestine
- AUS: Hyperechoic mucosal striations
- Dilated lacteals >25% of villus width
- Focal lipogranulomatous lymphangitis: mass form involving muscularis, serosa, mesentery
- Tx
    - Fat-restriction or other CE tx

Prognosis of Chronic Inflammatory Enteropathy

- Usually good
- Poor prognostic factors
    - Higher CIBDAI or CCECAI
    - Hypoalbuminemia
    - Hypocobalminemia
    - Hypovitaminosis D
- Diet and nutrition are supremely important!