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Signalment and Presentation

• “Bear”
• 1 year old, castrated male ferret
• 6 month duration of green, mucoid diarrhea
  ▫ Unresponsive to medical therapy
Diagnostics

- CBC: Severe thrombocytopenia
- Thoracic radiographs: Diffuse bronchial pattern
- Abdominal ultrasound: Hepatosplenomegaly

- Exploratory laparotomy
  - Hepatic and intestinal biopsies obtained
Clinical Outcome

• Progressive deterioration over the subsequent month
  ▫ Seizures, tachypnea, dyspnea
  ▫ Euthanasia elected

• Submitted for necropsy
Gross Morphologic Diagnoses

- Marked diffuse granulomatous interstitial pneumonia
- Marked multifocal widespread granulomatous hepatitis, splenitis, and lymphadenitis
Look at all the pretty friends!!
Microscopic Diagnosis

- Moderate to marked chronic multifocal to coalescing pyogranulomatous hepatitis and lymphadenitis with intrahistiocytic yeast (*Histoplasma capsulatum*)

- Marked numbers of yeast in spleen, lung, bone marrow, and choroid plexus
Ancillary Diagnostics

• Hepatic fungal culture
  ▫ Many colonies of *Histoplasma capsulatum*

• PCR, DNA extraction, and sequencing
  ▫ *Histoplasma capsulatum*
Final Diagnosis

• Disseminated histoplasmosis
Histoplasma capsulatum

- Dimorphic intracellular fungus
  - Grows in soil as saprophytic mold

- Flourish in nitrogen-rich organic matter
  - Soil contaminated with bird or bat guano

- Endemic in Mississippi, Ohio, and St. Lawrence river valleys
Pathogenesis

- Microconidia are ingested or inhaled
  - Transforms from saprophytic mold to yeast in lung
  - Phagocytosis by alveolar macrophages

- Result in acidification of the phagolysosome
  - Survival, replication, and persistence of intracellular yeast
Pathogenesis

- Infection is typically self limiting

- Immunosuppression or large dose of microconidia
  - Granulomatous pneumonia
  - Lymphoplasmacytic and histiocytic to granulomatous enterocolitis

- Systemic dissemination
  - Skin, eye, bone, rarely brain
Diagnosis

- **Histopathology/Cytology**
  - 2-4um diameter round to oval yeast
    - 1-2um diameter basophilic center, peripheral clear halo
    - Narrow based budding
  - PAS: pink to red
  - GMS: cell wall stains black

- **Fungal culture**
- **PCR, DNA extraction and sequencing**
- **Urine antigen test**
Histoplasmosis

- Animals used for hunting burrowing prey most commonly affected
  - Dogs
  - One report of hunting ferret affected

- Current case
  - Home heavily contaminated with aged bird feces
  - Infection via inhalation and/or ingestion of feces contaminated with microconidia
Questions?

- Thank You!
  - Dr. Kim Newkirk
  - UT resident mates