Multiple Organ Granulomas: An Interesting Game of Hide and Seek

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Signalment and History

- 2-year-old, spayed female, Labrador Retriever
  - Northeast Alabama
  - Primarily indoors
  - Access to 20 acre farm, horses, 4 other dogs

- 6-month history of pruritus, ulcerative nodules and diffuse alopecia

- 2-week history of anorexia, weight loss, vomiting, diarrhea

- Neutrophils and cocci observed on cytology

- Treated with methylprednisolone acetate, prednisone, and cephalaxin

- Euthanized
Necropsy

➢ Gross findings:
  ◦ Whole body alopecia
  ◦ Numerous ulcerated dermal nodules
  ◦ Granulomas within multiple organs
    ◦ Lungs
    ◦ Heart
    ◦ Omentum
    ◦ Liver
  ◦ Pericardial and peritoneal effusion
LUNG
HEART
OMENTUM
Histopathology Description:

Heart and liver – Nodular accumulations of numerous macrophages, neutrophils, scattered mast cells, eosinophils and angiocentric lymphocytes and plasma cells.

Heart - Cardiomyocytes exhibit varying degrees of degeneration and necrosis.

Liver – Adjacent to granulomas hepatic cords are partially effaced and compressed. There is multifocal intrahepatocellular and intracanalicular cholestasis. There are foci of hemorrhage and necrosis. Multifocally sinusoids are dilated and congested and lined by hypertrophic Kupffer cells.
Primary Morphological Diagnosis:
Heart and liver:

Disseminated granulomas
Diagnostic Testing

- Aerobic Culture and Sensitivity
  - *Staphylococcus intermedius* group
  - Yeast resembling *Malassezia pachydermatis*

- Fungal culture- Deep Systemic
  - Heavy growth of yeast resembling *Sporothrix schenckii*
  - Due to heavy contamination of *Malassezia* and *Dipolaris* species final identification could not be confirmed
Final Presumptive Diagnosis:

Sporotrichosis
Granulomatous Disease

Differential diagnosis
- *Sporothrix schenkii*
- *Histoplasma capsulatum*
  - 2-4um oval budding yeast, often clustering within macrophages
- *Cryptococcus neoformans*
  - 2-20um pleomorphic yeast, carminophilic capsule, single or narrow-based bud
- *Candida* spp.
  - Oval, budding yeast, 2-6um
- *Leishmania* spp. (southern Brazil)
  - 2x5-um, spherical to oval amastigotes containing a nucleus and rod-shaped kinetoplast, often found within cytoplasmic vacuoles of macrophages
- *Mycobacterium tuberculosis* (pulmonary, humans)
- *Trichosporon* spp. (humans)
Sporotrichosis

Common histological findings
- Nodular-to-diffuse pyogranulomatous or granulomatous inflammatory reaction
- Round, oval, or elongated (“cigar”-shaped) single or budding cells with refractile wall
- 2 to 6um or more in diameter (round and oval)
- 3 to 10um (cigar)*
- Organisms numerous in cats, rare in dogs and horses
- Yeast found free and/or within neutrophils and macrophages
- Sometimes yeast(s) surrounded by a stellate radial corona of brightly eosinophilic material (asteroid body/Splendore-Hoepli reaction)
Sporotricosis

Caused by *Sporothrix schenkii*

Found worldwide
- Most common in tropics
- Southern coastal regions, Missouri and Mississippi river valleys
- Endemic in Central and South America and Africa

Present in soil, wood, plants
- Warm environments, high humidity

Acquired from environment
- Penetrating wounds
  - Wood splinters, thorns, hay, etc.
  - Bites, scratches, pecks, stings
- Rarely inhalation of spores
Sporotricosis

Three forms recognized in veterinary medicine

- Primary cutaneous
  - Ulcerative cutaneous nodules confined to point of entry
  - High degree of host immunity prevents spread

- Cutaneous-lymphatic
  - Skin, subcutis, associated lymphatics
  - Spread proximally along lymphatics
  - Most common form in horses and humans

- Extracutaneous/disseminated
  - May involved a single extracutaneous site or multiple internal organs
  - Sequela to cutaneous-lymphatic
  - Occurs most frequently in cats
  - Rare in dogs
Sporotricosis

Pathogenicity

- Dimorphic ability
  - Yeast-like form in tissues and culture at 35-37°C
  - Filamentous mold (mycelial phase) at 25-30°C within the environment

- Environmental isolates will form hyphae and readily convert to a yeast-like form after inoculation into mice

Photo credit: Dr. Pete Christopherson, Auburn University
Sporotrichosis

Diagnostics
- Fungal culture
- Cytology
- Whole yeast agglutination
- Latex agglutination
- Serology (horses)
- Direct immunofluorescence
- Histology
  - Periodic acid-Schiff (PAS)
  - Gomori methenamine silver (GMS)
  - Gridley’s Stain
Sporotricosis

Many species affected
- Horses, cats*, dogs, and humans (“rose-grower’s disease”)

Disease is zoonotic and infected cats pose significant public health risk
- Typically harbor large amounts of organisms
- Found in mouth, nasal cavity, on nails, feces
- Can be transmitted through cuts and abrasions
- Immunocompromised individuals most susceptible

*Phylogenetic Analysis Reveals a High Prevalence of Sporothrix brasiliensis in Feline Sporotrichosis Outbreaks - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/239939869_fig2_Figure 2 - Clinical aspects of feline sporotrichosis in Brazil - Cats presenting ulcerated
References

http://www.cfsph.iastate.edu/Factsheets/pdfs/sporotrichosis.pdf


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QUESTIONS?