Case: L1601537
Dermal nodules in a dog

Shannon Dehghanpir, DVM

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Beau

- 2-year-old IM Lab
- Nodular dermal lesions and alopecia of 1-year duration
- Shared environment with a dog diagnosed with pythiosis
Dermatologic Examination

- Right axillary region and antebrachial surface near right elbow
- Multifocal to coalescing raised exudative dermal nodules (2 to 5 cm)
- Alopecia; hyperpigmentation
Cytology

Interpretation: Pyogranulomatosus inflammation with intralesional hyphae, most consistent with oomycosis.
Histopathology
Diagnosis

- **Morphologic**: Lymphoplasmacytic dermatitis and panniculitis with intralesional hyphae, necrosis, and sporadic ruptured epithelial cysts

- **Etiologic**: Oomycosis or Zygomycosis
PCR & Sequencing

- UT CVM Clinical Bacteriology and Mycology Laboratory

- DNA Extraction and PCR using Oomycete Primers
  - NS7 and NL2: Portion of SSU rRNA, ITS, 5.8 S rRNA, ITS2, portion of LSU rRNA
  - OOM COX 1-levup and FM85 MOD: Cox1 gene
  - COX 2F/COX 2R: Cox2 gene

- Sequencing
  - 1138 bp ITS region: 100% identity to unspecified Lagenidium sp., strain MTLA-06
  - 1144 bp ITS region: 92% identity to Paralagenidium kingii, strain C12-ES51
  - 752 bp cox1 gene: 100% identity to Paralagenidium sp., strain CO6-TW60
  - 631 bp cox2 gene: 99% identity to Lagenidium sp., strain MTLA-06

- Conclusion: Uncharacterized variant of Lagenidium or Paralagenidium species.

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# Deep Mycoses

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oomycosis</th>
<th>Zygomycosis</th>
<th>Phaeohyphomycosis</th>
<th>Hyalohyphomycosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classification</strong></td>
<td>Pseudo-fungi</td>
<td>Fungi</td>
<td>Fungi, pigmented</td>
<td>Fungi, hyaline</td>
</tr>
<tr>
<td><strong>Sites</strong></td>
<td>Cutaneous, GI (Pythium)</td>
<td>Nasopharynx (Conidiobolus)</td>
<td>Multifocal cutaneous lesions (“melanoma”)</td>
<td>Disseminated and corneal forms most common; cutaneous</td>
</tr>
<tr>
<td></td>
<td>Disseminated, Nodular dermatitis (Lagenidium)</td>
<td>Cutaneous (Basidiobolus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Immune Status</strong></td>
<td>Competent</td>
<td>Variable; usually competent with Entomophthorales</td>
<td>Compromised, history of immuno-suppressives</td>
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Information adapted from AM Grooters
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<td><strong>Morphology</strong></td>
<td>Broad, rarely septate, non-parallel walls</td>
<td>Broad, rarely septate, non-parallel walls with Splendore-Hoepli material</td>
<td>Pigmented, irregularly septate hyphae or yeast-like cells that exhibit dilatation</td>
<td>Non-pigmented, septate hyphae that exhibit dilatation and dichotomous branching</td>
</tr>
<tr>
<td><strong>Inflammatory Pattern</strong></td>
<td>Pyogranulomatous to eosinophilic</td>
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</tr>
<tr>
<td><strong>Genera</strong></td>
<td>Pythium, Lagenidium, Paralagenidium</td>
<td>Basidiobolus, Conidiobolus, Mucor, Rhizopus, others</td>
<td>Alternaria, Bipolaris, Cladophialophora, Xylohypha, others</td>
<td>Acremonium, Fusarium, Geotrichum, Phialospimplex, others</td>
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<tr>
<td><img src="image1.jpg" alt="Image" /> Wright's-Giemsa</td>
<td><img src="image2.jpg" alt="Image" /> Wright's-Giemsa</td>
<td><img src="image3.jpg" alt="Image" /> Wright's-Giemsa</td>
</tr>
<tr>
<td><img src="image4.jpg" alt="Image" /> GMS</td>
<td><img src="image5.jpg" alt="Image" /> H&amp;E</td>
<td><img src="image6.jpg" alt="Image" /> GMS</td>
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(Para)Lagenidiosis

- Pathogens of insects, crustaceans, and nematodes

- Not true fungi
  - Lack ergosterol within cell wall
  - Produce motile zoospores

- Exposure to warm freshwater habitats

- Fatal dermatologic and disseminated disease
  - Occult lesions in thorax and/or abdomen
  - Generally ~12 μm in diameter

- Chronic nodular dermatitis
  - Protracted course of disease; stable for years
  - Generally ~7.5 μm in diameter
Follow-Up

• Beau is doing well!

• The dermal nodules remain stable.

• Current Treatments:
  o Itraconazole 10 mg/kg once daily
  o Terbinafine 24 mg/kg once daily

• Recheck appointment scheduled in 3 months.
Special Thanks

• UT CVM Mycology Lab

• LSU VTH&C
  o Dr. Pucheu-Haston
  o Dr. Grooters

• LSU Pathology
  o Resident mates
  o Dr. Sakaguchi
  o Dr. Langohr
  o Dr. Gaunt
References

