Case: N11-98

Disseminated *Mycobacterium avium* complex (MAC) in a miniature schnauzer

Angelique Leone, VMD
Julia Conway, DVM, DACVP

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Presentation to the rDVM...

- 18 month old male miniature schnauzer
- 3 week history of lethargy, vomiting, diarrhea, lymphadenopathy and weight loss.
- Initial diagnostics at the rDVM:
  - CBC/Chem
  - Abdominal rads and palpation: possible splenic enlargement
- Initial treatment - ivermectin and famotidine
## CBC & Clinical Chemistry Abnormalities

<table>
<thead>
<tr>
<th>Marker</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST</td>
<td>110 H</td>
<td>15-66 U/L</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>80 L</td>
<td>92-324 mg/dL</td>
</tr>
<tr>
<td>Amylase</td>
<td>1249 H</td>
<td>290-1125 U/L</td>
</tr>
<tr>
<td>Lipase</td>
<td>71 L</td>
<td>77-695 U/L</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>0.8 L</td>
<td>1.0-4.0 ug/dL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>11.2 L</td>
<td>12.1-20.3 g/dL</td>
</tr>
</tbody>
</table>
Continued dxs & alteration of tx plan

• Failure to resolve clinical signs
• Cytology of lymph nodes
  - lymphoid hyperplasia and hyperemia with atypical epithelioid cells
• Additional treatments included supportive care and antibiotics

• Clinical signs continued = patient was referred to the University of Florida emergency service.
At UF emergency service

- Presented: obtunded, febrile, tachypneic, normocardic, with pale mucous membranes

- New CBC/Chem abnormalities:
  - Macrocytic, hypochromic anemia (PCV 26.5%) with a neutrophilia and monocytosis
  - Albumin 2.5 (2.9-3.8 g/dL)
Diagnostic Imaging
Thorax and abdomen
Spleen

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Liver

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Blood Smear

100x Wright Giemsa

100x Acid fast

Photos courtesy of Heather Wamsley, DVM, PhD, DACVP and Heather Kridel, DVM

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Lymph node cytology

Photos courtesy of Heather Wamsley, DVM, PhD, DACVP and Heather Kridel, DVM

100x Wright Giemsa

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Spleen
Spleen
Other organs affected...

- Bone marrow
- GALT
- Circulating blood
- Lymph nodes
Morphologic Dx:

- Disseminated mycobacteriosis, granulomatous, chronic, severe, multifocal, with numerous intrahistiocytic acid-fast bacilli
- Macrophages distended with negative staining (H&E) acid fast bacilli are present within:
  - all lymphoid tissues
  - circulating blood
- This immune response characterized by diffuse $T_h2$-biased granulomas was caused by the *Mycobacterium avium* complex (MAC).

*PCR confirmation of the bacterium courtesy of Jim Wellehan, DVM, MS, PhD, DACZM, DACVM (Virology, Bacteriology/Mycology)

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MAC Complex

• Includes:
  – *M. avium*
  – *M. avium ssp. paratuberculosis*
  – *M. intracellulare*

• Rarely reported to affect dogs and cats
• Alarming increase in number of miniature schnauzers within the last 6 years (49 cases)

• Scott-Ritchey Research Center and Auburn University SAC began researching an immunological defect that is being continued at the U of Pennsylvania
Genetic predisposition...
the miniature schnauzer

• Disseminated *M. avium* infection was diagnosed in 3 miniature schnauzer littermates (Eggers 1997)
  
  – Blood was collected from the 3rd dog prior to euthanasia
  – Mitogen stimulation tests revealed decreased T and B-lymphocyte response
  – 2-3 fold increase of B lymphocytes compared to T lymphocytes
  – Macrophage function was not assessed
References linking reporting MAC in miniature schnauzers...


Questions???

http://barakaminiatureschnauzers.com/