Ear Disease of the Cat

William H. Miller, Jr., VMD, DACVD
College of Veterinary Medicine
Cornell University
Ithaca, NY

Comparative study of aural microflora in healthy cats, allergic cats and cats with systemic disease
Pressanti C, Drouet C, and Cadiergues M

Malassezia pachydermatis and M. nana predominate amongst the cutaneous mycobiota of Sphynx cats

Scott, DW, Miller, WH, and Erb HN

The Cytology of the External Ear Canal in the Normal Dog and Cat
Tater KC, Scott DW, Miller WH, Jr, and Erb HN

Dogs (n=50)

<table>
<thead>
<tr>
<th>Organism</th>
<th>% Positive</th>
<th>Median Number (Range) /hpf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malassezia spp</td>
<td>96</td>
<td>0.2 (0-3.6)</td>
</tr>
<tr>
<td>Gram + cocci</td>
<td>42</td>
<td>0.0 (0-0.9)</td>
</tr>
<tr>
<td>Rod bacteria</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Cats (n=52)

<table>
<thead>
<tr>
<th>Organism</th>
<th>% Positive</th>
<th>Median Number (Range) /hpf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malassezia spp</td>
<td>83</td>
<td>0.2 (0-3.3)</td>
</tr>
<tr>
<td>Gram + cocci</td>
<td>71</td>
<td>0.3 (0-3.8)</td>
</tr>
<tr>
<td>Rod bacteria</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


Feline atopic dermatitis: a retrospective study of 45 cases (2001-2012)

Ravens PA, Xu BJ, and Vogelnest LJ


Results - Median age of onset was 2 years (62% <3 years; 21% >7 years, range 3 months to 12 years). Common presentations were severe (82%), non-seasonal (62%), weeping (88%) or pruritus, with esputum/crusting/erosions and/or erosion/excoriation (73%). Milary dermatitis (36%) and scanorotic granule complex lesions (27%) occurred. The face/head (21%), ventral abdomen (11), neck (10%), limbs (9%), paws (7%), dorsal (1%), and tail (1%) were frequently affected sites. All wounds were restricted to the head/chest in only five cats (11%). Causative pathogens included M. pachydermatis (10%), superficial bacterial pyodermas (43%), Malassezia dermatitis (7%), Feeline hyperesthesia (24%) and adverse food reaction (13%) occurred.

Inflammatory Otitis

- Classification scheme for dogs
  - Primary Causes: Allergy, parasites, etc
  - Secondary causes: Bacteria, yeast, etc
  - Perpetuating factors: Structural issues
  - Predisposing factors: Systemic disease, moisture, etc

- Classification scheme for cats
  - WHY DOES THIS CAT HAVE EAR DISEASE??

Parasitic Otic Disease

- Otodectes cyanotis
- Demodex cati
- Mammomonogamus aurus
- Accidental: Fleas, ticks, etc.

Furalaner

- Bravecto™
- Fleas and ticks
- Highly protein bound
- Approved for use in pregnancy and lactation
- Administer every 3rd month
- FDA-registered

Bacterial Otitis Externa

- Rare as a primary disorder
- Causative organisms?
- Variable causality
  - Epithelial defects
    - Drug issues
  - Mass lesions
  - Extension from middle ear

Malassezia Otitis Externa

- Most common “infectious” disease of the cat’s ear
- Multiple Malassezia species
- Associated with allergic disorders or those which disrupt the integrity/ecology of the ear canal
Treatment of Inflammatory Otitis Externa

- **Above all - Do no harm!!**
- **Topicals**
  - Cleaners: Once or twice
  - Anti-parasitics: Clean ears first
  - Anti-infectives: 14 day maximum?
- **Systemics**
  - Anti-parasitics: Transotic, transdermal, oral
  - Anti-infectives
  - Anti-inflammatories

Otic Products Licensed for the Cat

<table>
<thead>
<tr>
<th>Product</th>
<th>Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animax</td>
<td>Nystatin, neomycin, thiostrepton, triamcinolone</td>
</tr>
<tr>
<td>Gentotin otic</td>
<td>Gentamycin, betamethasone</td>
</tr>
<tr>
<td>Tresaderm</td>
<td>Neomycin, thiabendazole, dexamethasone</td>
</tr>
<tr>
<td>Ketoctol</td>
<td>Ketokonazole, hydrocortisone</td>
</tr>
<tr>
<td>Zymox Otic HC</td>
<td>Lysozyme, lactoferrin, lactoperoxidase, hydrocortisone</td>
</tr>
</tbody>
</table>
| Tritop & Neo-Predef| Neomycin, isoflurjoned, tetracaine

Common Otic Products Not Licensed for the Cat

<table>
<thead>
<tr>
<th>Product</th>
<th>Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otomax</td>
<td>Gentamicin, betamethasone, clotrimazole</td>
</tr>
<tr>
<td>Mometamax</td>
<td>Gentamicin, mometasone, clotrimazole</td>
</tr>
<tr>
<td>Posatex</td>
<td>Orbifloxacin, mometasone, posaconazole</td>
</tr>
<tr>
<td>Surolan</td>
<td>Polymyxin, prednisolone, miconazole</td>
</tr>
<tr>
<td>Baptop otic</td>
<td>Enrofloxacin, silver sulfadiazine</td>
</tr>
<tr>
<td>eesOtic</td>
<td>Gentamicin, hydrocortisone acroapone, miconazole</td>
</tr>
<tr>
<td>HydroB 1020</td>
<td>Burrows solution, hydrocortisone</td>
</tr>
<tr>
<td>Claro</td>
<td>Flofencicol, tetrabine, mometasone</td>
</tr>
<tr>
<td>Osurina</td>
<td>Flofencicol, tetrabine, betamethasone</td>
</tr>
</tbody>
</table>

Relative Steroid Potency

<table>
<thead>
<tr>
<th>Drug</th>
<th>Potency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocortisone acetate</td>
<td>1</td>
</tr>
<tr>
<td>Hydrocortisone acponate</td>
<td>&gt;30</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>4</td>
</tr>
<tr>
<td>Triamcinolone acetonide</td>
<td>5</td>
</tr>
<tr>
<td>Isoflurjoned</td>
<td>14</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>25</td>
</tr>
<tr>
<td>Betamethasone valerate</td>
<td>30</td>
</tr>
<tr>
<td>Mometasone furoate</td>
<td>231</td>
</tr>
</tbody>
</table>

Tresaderm®: 5 drops/ear q12h 20 drops = 1.0 mg of dexamethasone = 0.25 mg prednisolone
Posatex™: 4 drops/ear q24h 8 drops = 0.2 mg of mometasone = 11.6 mg prednisolone

Cystadenomatosus
Cystadenomatous

- Cystic dilation of the epitracial sweat glands (skin) or ceruminous glands (ear)
- Unknown cause
- Space occupying lesions
- Malignant transformation possible?

Treatment

- Observation
- Drainage with sclerosis
- Local removal
  - Cyrosurgery
  - CO2 laser
- Palliative medical management
- Ear surgery

Feline Proliferative and Necrotizing Otitis Externa

- Rare
- Kittens predominate
  - Healthy otherwise
  - FeLV, FIV negative
- Uncertain pathomechanism
  - Infiltration of CD3 positive T-cells
  - Negative testing for herpesvirus, calicivirus, and papillomavirus

Feline Proliferative and Necrotizing Otitis Externa

- Rapid development of clinical lesions
- Minimal clinical signs
- Cytological evidence of bacterial/yeast infection common
- Spontaneous resolution the rule?
Treatment

• Observation
• Episodic topical treatments
• Oral steroids
• Immunomodulators
  • Oral cyclosporine: 7 mg/kg q12h
  • Topical tacrolimus: q12h

Tacrolimus

0.03 and 0.1 % ointement
Nonatrophogenic
Irritating
Macrolactam Immunomodulator
Decreased T lymphocyte maturation and activation
Decreased cytokine expression in T cells, Langerhans' cells, keratinocytes, mast cells, and eosinophils
Decreased production of IL-2, IL-3, IL-4, IL-6, TNF-α

Otic Masses

• Nasopharyngeal polyp
• Ceruminous gland mass
  • Adenoma
  • Adenocarcinoma
• Squamous cell carcinoma
• Other

Nasopharyngeal Polyps

• Most common ear mass of the cat
• Unilateral usually
• Originate from the mucosal lining of the middle ear or the eustachian tube
• Uncertain etiology

Prevalence of select infectious agents in inflammatory aural and nasopharyngeal polyps from client-owned cats

Table 2. Distribution of nucleic acid amplification results from the buccal of 12 normal cats and 30 inflammatory polyps.

<table>
<thead>
<tr>
<th>Group</th>
<th>FHV-1</th>
<th>FIV</th>
<th>Mycoplasma species</th>
<th>Bartonella species</th>
<th>C. felis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (n = 24)</td>
<td>2 (8.3%)</td>
<td>1 (8.3%)</td>
<td>2 (8.3%)</td>
<td>1 (8.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Poly on mouth (n = 15)</td>
<td>0 (0%)</td>
<td>2 (13.3%)</td>
<td>4 (26.6%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Poly on cheek (n = 15)</td>
<td>1 (6.7%)</td>
<td>1 (6.7%)</td>
<td>0 (0%)</td>
<td>2 (13.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Poly on wall (n = 30)</td>
<td>1 (3.3%)</td>
<td>3 (10%)</td>
<td>4 (13.3%)</td>
<td>2 (6.7%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

F < 0.05 for all comparisons.

Clinical Findings

• Nasopharyngeal signs: dysphagia, etc
• Middle ear signs: Horner’s, vestibular disease
• External ear signs: head shaking, discharge, etc.
Middle Ear Disease

- Unknown frequency
- Neurologic signs most common
  - Horner’s syndrome
  - Head tilt

Histologic Characterization of the Cat Middle Ear: In Sickness and in Health
Sula MM, Njaa BL, and Payton ME
Vet Pathol 51:951-967, 2014

- 50 cats (100 ears) examined
- 52 ears normal grossly and histologically
- 48 ears diseased
  - 34 histologically only
  - 14 grossly and histologically
- Disease severity variable
  - Mild to moderate: 37
  - Severe: 11

Prevalence of clinical abnormalities in cats found to have nonneoplastic middle ear disease at necropsy: 59 cases (1991-2007)
Schlicksup MD, VarWinkle TL, and Holt DE.

- 3442 cats: 84 identified - 59 studied
- Clinical findings
  - URI: 11/59
  - Otitis externa: 17/59
  - Middle ear signs: 6/59
    - Unilateral peripheral vestibular disease 5/6
  - Horner Syndrome: 1/6
- Pathologic findings
  - 33/59 unilateral disease
  - 47 cats (68 ears): suppurative process
  - 5 cats (6 ears): hemorrhagic process

Prevalence of Clinical and Subclinical Middle Ear Disease in Cats Undergoing Computed Tomographic Scans of the Head
Shanaman M, Seiler G, and Holt DE.

| Table 1: CT findings in Cats with Evidence of Middle Ear Disease |
|------------------|------------------|------------------|------------------|
| Primary cause of middle ear disease | Clinical symptoms of middle ear disease | Pathologic findings |
| (100%) | (100%) | (100%) |
| Primary | Otitis media | Otitis externa | Middle ear signs | Horner’s syndrome | Pathologic findings |
| Prevalence | 20 (20%) | 65 (65%) | 15 (15%) | 4 (4%) |
| Normal | 19 (19%) | 60 (60%) | 14 (14%) | 4 (4%) |
| Abnormal | 31 (31%) | 3 (3%) | 1 (1%) | 0 (0%) |

*Total use of ear inappropriate due to inaccessible EAC