

## Ear Disease of the Cat



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### The Cytology of the External Ear Canal in the Normal Dog and Cat

Tater KC, Scott DW, Miller WH, Jr, and Erb HN  
Journal of Veterinary Medicine Series A: 50: 370-74, 2003

#### Dogs (n=50)

Organism	% Positive	Median Number (Range) /hpf
<i>Malassezia</i> spp	96	0.2 (0-2.6)
Gram + cocci	42	0 (0-0.9)
Rod bacteria	0	0

#### Cats (n=52)

Organism	% Positive	Median Number (Range) /hpf
<i>Malassezia</i> spp	83	0.2 (0-3.3)
Gram + cocci	71	0.3 (0-3.8)
Rod bacteria	0	0

### Comparative study of aural microflora in healthy cats, allergic cats and cats with systemic disease

Pressanti C, Drouet C, and Cadiergues M  
J Feline Med and Surg 16:992-96, 2014

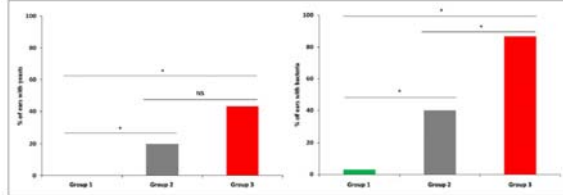


Figure 3. Yeast (left) or bacterial (right) overgrowth in ear canals of healthy cats (group 1), cats with a systemic disease (group 2) and allergic cats (group 3). NS = not significant, P = 0.05 \*Difference between the two groups

### Occurrence of *Malassezia* Species in Persian and Domestic Short Hair Cats with and without Otitis Externa

Shokri H, Khosravi A, Rad M, and Jamshidi S  
J Vet Med Sci 72: 293-96, 2010

Table 2. Frequency of the isolation and percentage of *Malassezia* species from external ear canal of 31 normal cats and 82 cats with otitis externa

Characteristics	Normal cats (No. %)		Cats with otitis externa (No. %)		Total
	Persian	Short hair	Persian	Short hair	
Age (year)					
< 1	2(13.3)	5(33.3)	1(6.7)	7(46.7)	15(13.2)
1-4	0	7(16.7)	12(4)	34(81)	42(36.8)
5-8	2(6.3)	8(25)	5(15.6)	17(53.1)	32(28.1)
≥ 8	3(12)	5(20)	12(48)	5(20)	25(21.9)
Total	6(5.3)	25(21.9)	19(16.7)	65(55.3)	113(100)
Yeast isolates					
<i>M. furfur</i>	0	1(25)	3(75)	0	4(2.9)
<i>M. globosa</i>	0	0	2(14.3)	12(85.7)	14(10.2)
<i>M. sympodialis</i>	0	0	5(100)	0	5(3.6)
<i>M. slooffiae</i>	0	0	1(11.1)	8(88.9)	9(6.6)
<i>M. pachydermatis</i>	2(2.4)	9(11)	15(18.3)	56(68.3)	82(59.9)
<i>M. obtusa</i>	0	2(9.5)	0	19(90.5)	21(15.3)
<i>M. restricta</i>	0	0	0	2(100)	2(1.5)
Total	2(1.5)	12(8.8)	26(19)	97(70.8)	137(100)

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

Volk AV, Belyavin CE, Varjonen K, et al. J Feline Med and Surg 12: 917-22, 2010

Table 2. Frequency of isolation of *Malassezia pachydermatis*, *Malassezia slooffiae* and *Malassezia nana* from healthy CRC (n = 33), DRC (n = 21), DSH (n = 10) and Sphynx (n = 17) cats, and seborrheic DRC (n = 9).

Malassezia species	Healthy				Seborrheic
	Sphynx N (%)	Comish Rex N (%)	DSH N (%)	Devon Rex N (%)	Devon Rex N (%)
No <i>Malassezia</i> species	0	20 (61)	5 (50)	3 (14)	0
<i>M. pachydermatis</i>	6 (33)	5 (15)	4 (40)	13 (62)	6 (67)
<i>M. slooffiae</i>	0	1 (3)	1 (10)	1 (5)	0
<i>M. nana</i>	0	1 (3)	0	0	0
<i>M. pachydermatis</i> and <i>M. slooffiae</i>	0	0	0	4 (19)	3 (33)
<i>M. pachydermatis</i> and <i>M. nana</i>	10 (55)	5 (15)	0	0	0
<i>M. slooffiae</i> and <i>M. nana</i>	0	0	0	0	0
<i>M. pachydermatis</i> , <i>M. slooffiae</i> and <i>M. nana</i>	2 (11)	1 (3)	0	0	0
Total	18 (100)	33 (100)	10 (100)	21 (100)	9 (100)

### Feline dermatology at Cornell University: 1407 cases (1988-2003)

Scott, DW, Miller, WH, and Erb HN  
J Feline Med and Surg 15:307-316, 2013

Table 5. Dermatoses of the external ear diagnosed at the Cornell University Hospital for Animals (n = 185 diagnoses)

Dermatoses	Number of cases	% of 1887 dermatologic diagnoses	% of total cat population (n = 22,135)
<i>Malassezia</i> otitis externa*	43	2.3	0.19
Bacterial otitis externa	41	2.2	0.19
Allergies†	36	1.9	0.16
Cutaneous adverse drug reaction	19	1.0	0.25
Ictophagic excessive cerumen production	9	0.5	<0.1
Demodicosis‡	6	0.3	<0.1
Cerumenal gland carcinoma	6	0.3	<0.1
Cerumenal gland adenoma	5	0.3	<0.1
Ear polyp	4	0.2	<0.1
Cerumenal gland cyst	3	0.2	<0.1
Ictophagic pruritis alopecia (bilateral)	3	0.2	<0.1
Pattern baldness	2	0.1	<0.01
Nasopharyngeal polyp	2	0.1	<0.01
Cerumenolith	2	0.1	<0.01
Ictophagic curled pinna (unilateral)	1	<0.1	<0.01
Auricular chondritis	1	<0.1	<0.01
Aural hematoma	1	<0.1	<0.01
Ear canal mass††	1	<0.1	<0.01

\*Ninety of the cats (44.2%) had allergy or atopic dermatitis  
†These cats had allergy, atopic dermatitis or food allergy. Symmetrical otic pruritis was the only reaction pattern  
‡All cats had Demodex ear  
††All cats had Demodex ear  
§§No diagnostics were performed

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

Ravens PA, Xu BJ, and Vogeinst LJ  
 Vet Dermatol 25: 95-102, 2014

**Results** – Median age of onset was 2 years (62% <3 years; 22% >7 years; range 3 months to 12 years). Common presentations were severe (82%), nonseasonal (82%), waxing/waning (36%) pruritus, with alopecia/crusting/excoriations and/or erosions/ulceration (73%). Miliary dermatitis (20%) and eosinophilic granuloma complex lesions (27%) occurred. The face/head (71%), ventral abdomen (51%), neck (51%), limbs (38%), pinnae (31%), dorsum/rump (31%) and feet (16%) were frequently affected sites; lesions were restricted to the head/neck in only five cats (11%). Concurrent otitis externa (16%), superficial bacterial pyo-derma (49%), *Malassezia* dermatitis (7%), flea-bite hypersensitivity (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 auris*
- **Accidental: Fleas, ticks, etc.**

**Furalaner**



- Bravecto™
- Fleas and ticks
- Highly protein bound
- Approved for use in pregnancy and lactation
- Administer every 3<sup>rd</sup> 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**



**Treatment**



Petitepetpills.com

- 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**

Product	Ingredients
Animax	Nystatin, neomycin, thioestrepton, triamcinolone
Gentocin otic	Gentamycin, betamethasone
Tresaderm	Neomycin, thiabendazole, dexamethasone
Ketocort	Ketoconazole, hydrocortisone
Zymox Otic HC	Lysozyme, lactoferrin, lactoperoxidase, hydrocortisone
Tritop & Neo-Predef	Neomycin, isoflupredone, tetracaine

**Common Otic Products Not Licensed for the Cat**

Product	Ingredients
Otomax	Gentamicin, betamethasone, clotrimazole
Mometamax	Gentamicin, mometasone, clotrimazole
Posatex	Orbifloxacin, mometasone, posaconazole
Surolan	Polymyxin, prednisolone, miconazole
Baytril otic	Enrofloxacin, silver sulfadiazine
easOtic	Gentamicin, hydrocortisone aceponate, miconazole
HydroB 1020	Burrows solution, hydrocortisone
Claro	Florfenicol, terbinafine, mometasone
Osurina	Florfenicol, terbinafine, betamethasone

**Relative Steroid Potency**

Drug	Potency
Hydrocortisone acetate	1
Hydrocortisone aceponate	>30
Prednisolone	4
Triamcinolone acetonide	5
Isoflupredone	14
Dexamethasone	25
Betamethasone valerate	30
Mometasone furoate	231



**Tresaderm**<sup>®</sup>: 5 drops/ear q12h    20 drops = 1.0 mg of dexamethasone = 6.25 mg prednisolone  
**Posatex**<sup>™</sup>: 4 drops/ear q24h    8 drops = 0.2 mg of mometasone = 11.6 mg prednisolone

**Cystadenomatosis**

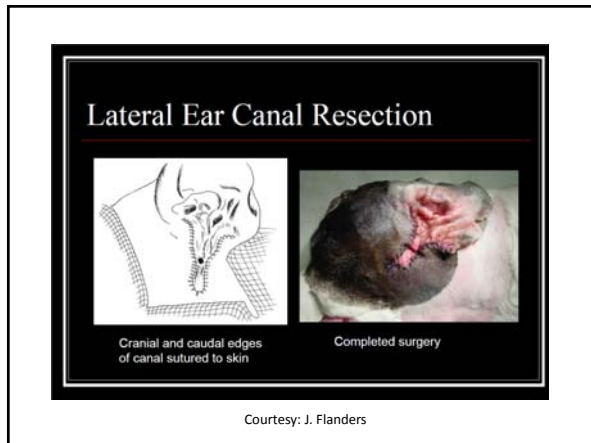


**Cystadenomatosis**

- Cystic dilation of the epitrichial 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



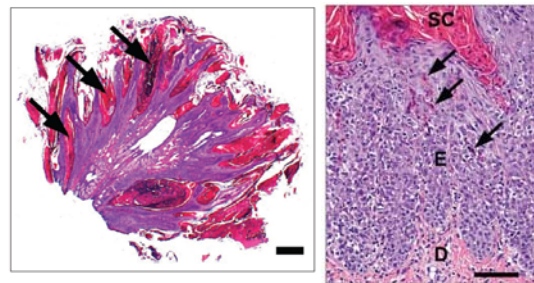
**Feline Proliferative and Necrotizing Otitis Externa**

- 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?

**Feline Proliferative and Necrotizing Otitis Externa**



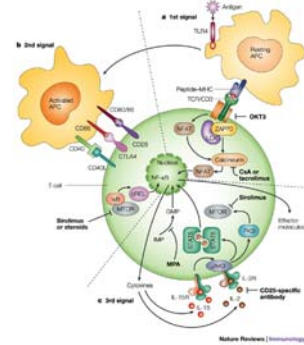
JAVMA, Vol 241, No. 5, September 1, 2012

## Treatment

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

## Tacrolimus

- 0.03 and 0.1 % ointment
- Nonatropogenic
- 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-5, TNF- $\alpha$



## 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

Tyler C, Klose TC, MacPhail CM, Schultheiss PC, Rosychuk RA, Hawley JR, and Lappin MR. J Feline Med and Surg 12:769-74, 2010

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

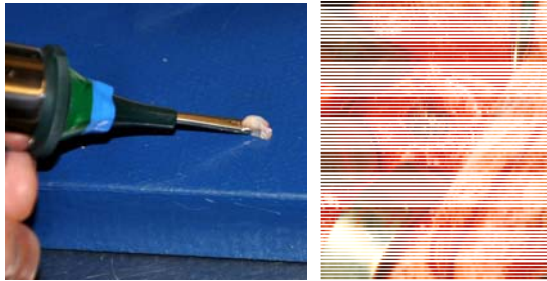
Group	FHV-1	FCV	Mycoplasma species	Bartonella species	C felis
Normal (n = 24)	2 (8.3%)	1 (4.2%)	2 (8.3%)	1 (4.2%)	0 (0%)
Polyps-formalin (n = 13)	0 (0%)	2 (15.4%)	4 (30.8%)	0 (0%)	0 (0%)
Polyps-fresh (n = 17)	1 (5.6%)	1 (5.6%)	0 (0%)	2 (11.1%)	0 (0%)
Polyps-combined (n = 30)	1 (3.3%)	3 (10.0%)	4 (13.3%)	2 (6.7%)	0 (0%)

P > 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.

## Treatment



## Ceruminous Gland Tumors



G. Marignac  
Parasitologie  
ENV-Elfort

## Middle Ear Disease

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

### Prevalence of Clinical and Subclinical Middle Ear Disease in Cats Undergoing Computed Tomographic Scans of the Head

Shanaman M, Seiler G, and Holt DE.  
Vet Radiol and Ultrasound 53:76-79, 2012

TABLE 1. CT Findings in Cats with Evidence of Middle Ear Disease

	Primary nasal disease as presenting complaint	Clinical signs suggestive of nasal disease	No presenting complaint or clinical signs of nasal disease
Percentage of cohort positive for middle ear disease (total no. of middle ear positive cats = 101/100 or 101%)	26/33 cats (79%), 33 ears affected	41/87 (47%), 65 ears affected	34/180 (18%), 46 ears affected
CT findings			
Ears affected			
Left or right	19/26 (73%)	17/41 (41%)	22/34 (65%)
Both	7/26 (27%)	24/41 (59%)	12/34 (35%)
Components affected			
One (ventromedial/dorsolateral)	2/33 (6%)	11/65 (17%)	7/46 (15%)
Both	31/33 (94%)	54/65 (83%)	39/46 (85%)
Presence of contrast enhancing middle ear contents*	10/29 (34%)	15/51 (29%)	11/36 (30%)
Presence of tympanic bullae lysis	5/33 (15%)	4/65 (6%)	3/46 (7%)
Presence of tympanic bullae thickening	24/33 (73%)	43/65 (66%)	33/46 (72%)

\*Total nos. of ears represents those with measurable ROI.

### 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, VanWinkle TJ, and Holt DE.  
J Am Vet Med Assoc 235: 841-43, 2009

- 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