



LifeClass Portorož



WSAVA
Global Veterinary Community



FECAVA
Federation of European Companion
Animal Veterinary Associations

Dermatološki dan SZVMŽ

SiSAVA Dermatological day

Zbornik referatov

Conference proceedings

Predavateljica / Course speaker:

Dr. Chiara Noli, DVM, Dipl. ECVD



VETPROMET
SKRBIMO ZA ŽIVALI.

Glavni sponzor



**Slovensko združenje
veterinarjev za male živali**
Slovenian Small Animal
Veterinary Association

Cesta v Mestni log 47
1000 Ljubljana
Slovenija

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<https://www.zdruzenje-svmz.si/>

Kongresni center Portus, Hotel Slovenija, Portorož, Slovenija
9. oktober 2021

Vsebina

Chiara N.	
Dermatophytosis.....	6
Feline skin parasites.....	18
Feline allergy.....	26
Food allergy in cats.....	36
How to successfully treat allergic cats	44
Autoimmune diseases.....	56
Feline exfoliative dermatitis.....	66
Genetic diseases of cats.....	80

Glavni sponzor:



Vetpromet d.o.o.
Cesta na Brdo 100, 1000 Ljubljana

Ostali sponzorji:



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Šmarješka cesta 6, 8501 Novo mesto



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Cesta v gorice 8, 1000 Ljubljana



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Obrtniška ulica 1, 1225 Lukovica



**Slovensko združenje
veterinarjev za male živali**
Slovenian Small Animal
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Izdalo:
Slovensko združenje
veterinarjev za male živali

Oblikovanje:
AKTA design
www.aktadesign.si

150 izvodov

Program

Moderatorica: Kralj L.

08.30 – 09.00	PRIJAVA UDELEŽENCEV	13.30 - 14.15	Terapija atopičnega dermatitisa
09.00 - 10.00	Dermatofitoze	14.15 - 15.00	Avtoimune bolezni mačk
10.00 - 10.30	Paraziti	15.00 – 15.30	ODMOR
10.30 – 10.50	ODMOR	15.30 - 16.30	Imunsko posredovane bolezni mačk
10.50 - 11.00	<i>Sponzorsko predavanje - Vetpromet</i>	16.30 - 17.00	Izbrane genetske bolezni
11.00 - 11.45	Alergija - klinična predstavitev	19.00	AFTER PARTY (Marina Portorož)
11.45 - 12.30	Alergija na hrano in njena diagnoza		
12.30 – 13.30	KOSILO		

ORGANIZACIJSKI IN UREDNIŠKI ODBOR SZVMŽ

Lara Kralj, dr. vet. med., predsednica Dermatološke sekcije SZVMŽ



Upravni odbor SZVMŽ

Izr. prof. dr. Alenka Seliškar, dr. vet. med. (predsednica)
 Prof. dr. Nataša Tozon, dr. vet. med. (podpredsednica – bodoča predsednica)
 Milan Matko, dr. vet. med. (podpredsednik – prejšnji predsednik)
 Sara Suhadolc Scholten, dr. vet. med. (tajnica)
 Andreja Kastelic Hrček, dr. vet. med. (blagajničarka)
 Saša Hrušovar Podpečan, dr. vet. med. (članica)
 Živa Černe, dr. vet. med. (članica)

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DERMATOPHYTOSIS



Dermatophytosis
Dr. Chiara Noli, Dip ECVD
Peveragno (CN), Italy

Fomite carriage

- ◉ Infected hair breaks easily and diffuses to the environment
- ◉ Beddings, toys, brushes, clippers, (white) coats, gloves, parasites, airborne



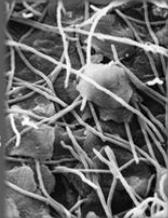
Aetiology

- ◉ there are 38 species of dermatophytes pathogenic for man and animals
- ◉ 3 genres: *Microsporum*, *Trichophyton* and *Epidermophyton*.
- ◉ 13 species are able to infect cats and dogs:
 - dogs: *M. canis*, *T. mentagrophytes*
• rarely *T. erinacei* and *M. persicolor*
 - cats: 98% *Microsporum canis*
• it is not part of the normal feline cutaneous microbial flora!!!
 - man: *T. rubrum*



Mechanism of infection

- ◉ Adherence to corneocytes
- ◉ Germination within 6 hours
- ◉ Penetration through epidermis
- ◉ Invasion of keratin
- ◉ Production of hyphae and spores
- ◉ Environmental contamination



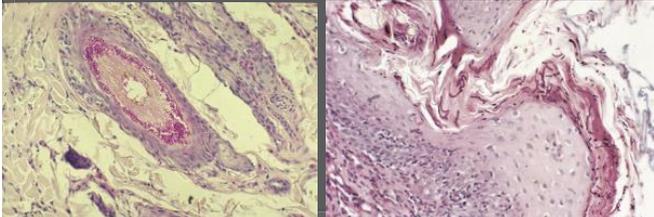
Mechanism of infection

- ◉ Contact with an infected animal (more frequent) or a contaminated environment (less frequent)



Invasion of keratin

- ◉ Anagen hair: most dermatophytes
- ◉ Only epidermal stratum corneum: *M. persicolor* and *E.*



Factors preventing the infection

- ◉ Grooming removes the spores from the skin
- ◉ Intact stratum corneum, epidermal turnover, antifungal properties of sebum and sweat
- Animals that do not groom are predisposed:
 - young, old, ill, long-haired animals
- Microtrauma favours the infection:
 - Brushing, combing, clipping, parasites, scratching, maceration, warm and humid climate, bathing, etc.



Classification of infection types

(Moriello JFMS 2014)

1. Simple infection

- healthy animal, not stressed, not immunodeficient
- evident lesions but not extensive,
- good prognosis with clinical cure



Evolution of the infection in cats

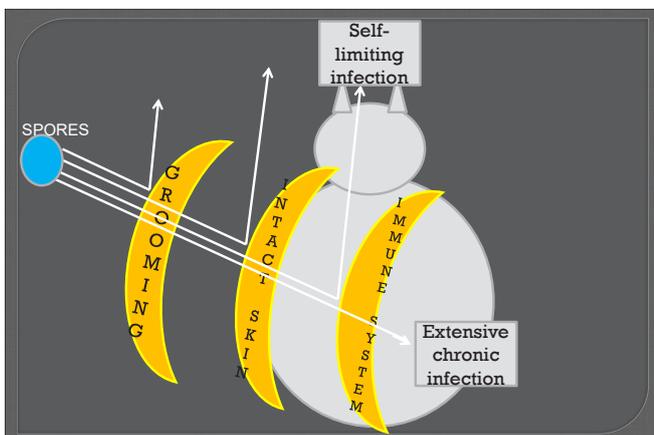
- ◉ Incubation period 5 days – 3 weeks
- ◉ In healthy animals development of evident but limited lesions
- ◉ Development of a cell-mediated immunity
- ◉ Self cure in 60-100 days
- ◉ Development of immunity towards future re-infections, especially if self cured and not treated
 - Usually complete with no new infections
 - In case of large experimental inoculi less severe lesions and more rapid resolution

Classification of infection types

(Moriello JFMS 2014)

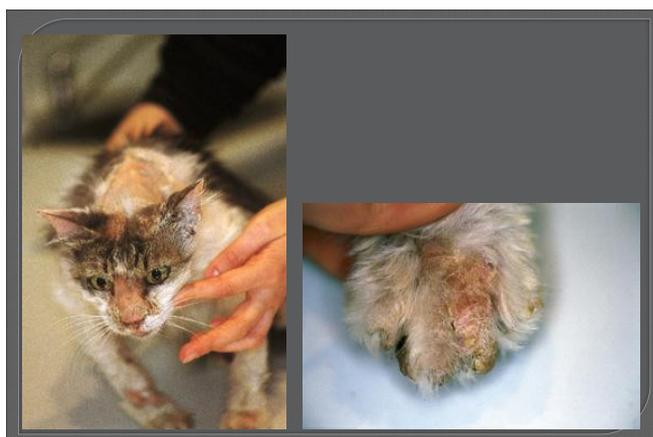
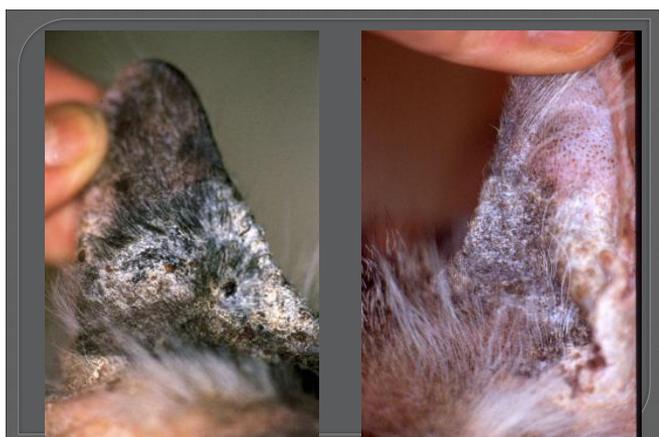
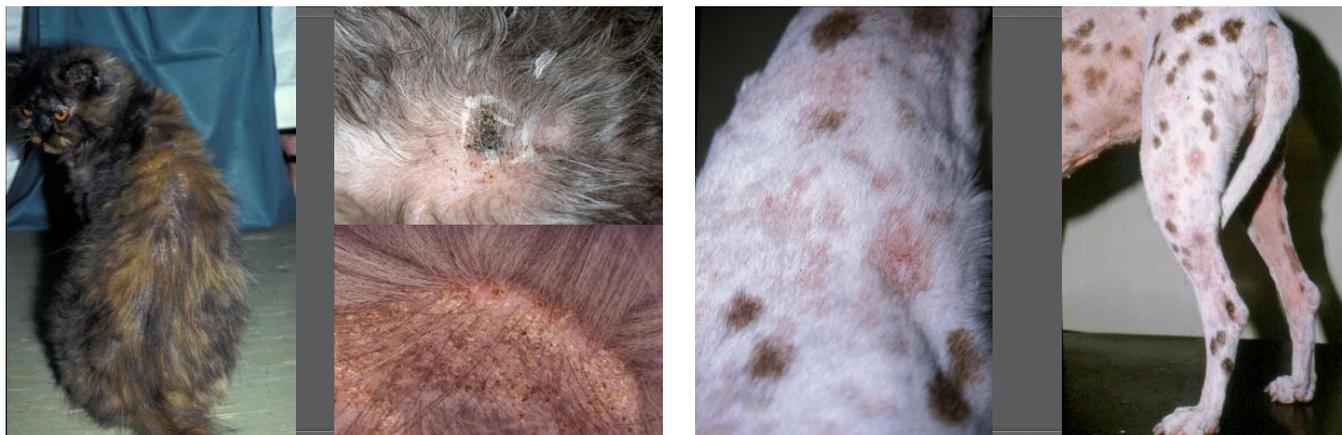
2. Complicated infection

- Animals with underlying/coexistent diseases
- Long-haired animals, matted hair, lack of grooming
- Relapsing dermatophytosis
- Extensive lesions
- Stray cats



Clinical signs

- ◉ The type of dermatophyte, its virulence factors, the species of the infected animals and the host immune response determine the clinical signs and the course of the infection:
 - asymptomatic carrier - pseudomycetoma
 - focal / multifocal alopecia - onychomycosis
 - miliary dermatitis (cats)
 - diffuse alopecic / scaly / inflammatory lesions
 - crusts, similar to pemphigus foliaceus



Trychophyton infection

severe inflammatory lesions of face and limbs, may mimic immune-mediated diseases



copyright C. Foil, from Griffin et al. : "Current Veterinary Dermatology", 1993, p. 66

Epidermal dermatophytosis

- caused most frequently by *M. persicolor*
- small crusts often on nose and muzzle
- ATTENTION: may be clinically and histologically identical to pemphigus



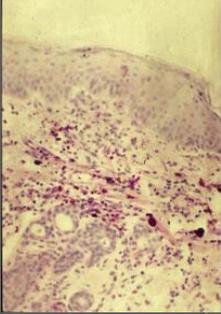

Kerion

- deep, suppurative inflammatory lesions
- single or multiple nodules
- often caused by *M. gypseum*
- similar to histiocytomas




Pseudomycetoma

- usually reported in Persian cats, but also in other breeds and dogs
- granulomatous panniculitis caused by *M. canis*
- large ulcerated nodules with yellow tissue grains



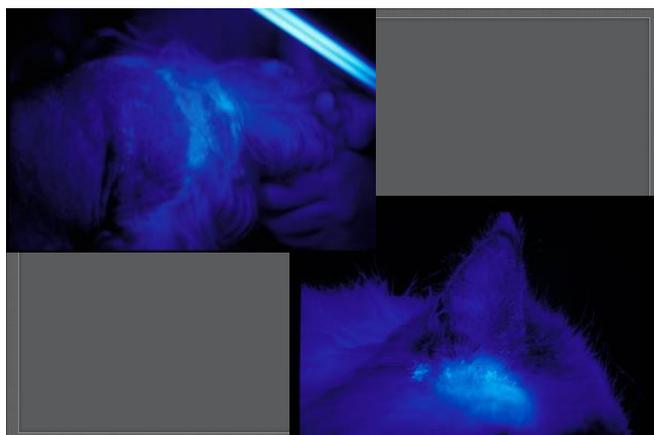
Onychomycosis/paronychia

- infection of nail and nailbed, very rare
- often geophylic fungi
- often only one or few nails
- swollen nailbed, broken brittle nails





Diagnosis



Be sure of the diagnosis

- ◉ Clinical assessment alone is not accurate
→ use other diagnostic tools to confirm the diagnosis (trichoscopy, Wood's lamp, culture) → avoid unnecessary treatment!

Total of 5644 shelter cats		
584 no skin lesions, culture positive	94 skin lesions, culture positive	381 skin lesions, culture negative

Microscopic examination of hairs (trichoscopy)

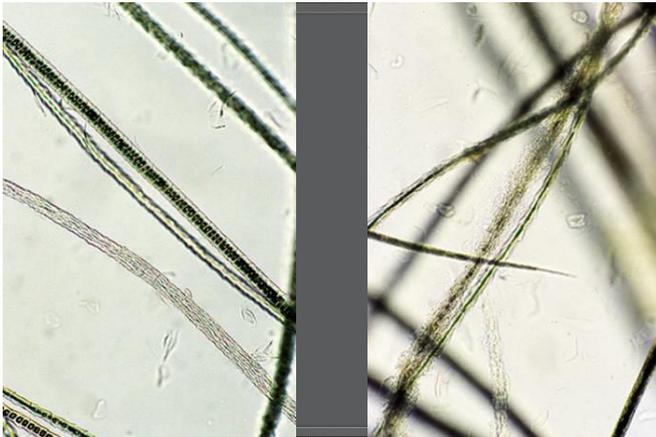
- ◉ pick from the center and from the periphery of the lesions
- ◉ best use fluorescent hairs
- ◉ put some hair on a slide on a drop of mineral oil
- ◉ cover with coverslip

Wood's lamp examination

- ◉ UV-light lamp 253,7 nm wavelength
- ◉ warm it up for 5 minutes before using it
- ◉ in a dark room, keep 5 minutes on the lesions
- ◉ 50% of *M. canis* strains show apple-green fluorescence, at the basis of hair shafts ONLY
- ◉ false positives: dust, crusts, follicular casts, treatments

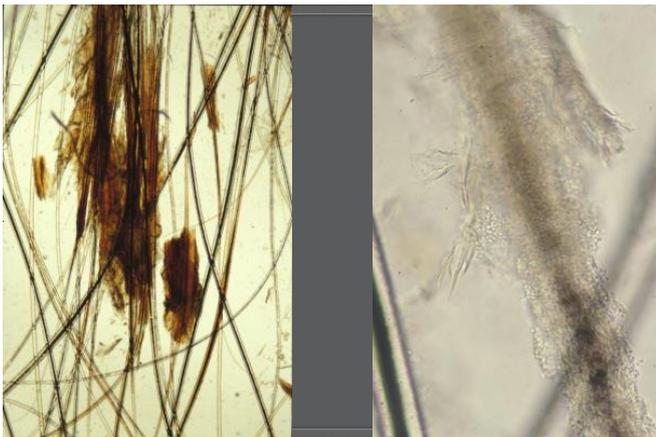
Microscopic examination of hairs (trichoscopy)

- ◉ 4x and 10x, if in doubt 40x
- ◉ "brush broken" hairs
- ◉ hairs with a "dirty" irregular surface
- ◉ results:
 - positive only 50% of times (depends strongly on the skills of the operator)
 - false positives: internal root sheath and keratin of follicular casts
 - macroconidia are NOT significant (saprophytes)



Fungal culture 2

- ◉ use sterile forceps and scalpel blades
- ◉ pluck hair from both center and periphery
- ◉ add broken hairs and scales
- ◉ cut distal end of long hair
- ◉ use sterile toothbrush
- ◉ put in a sheet of paper if you cannot inoculate a culture plate immediately
- ◉ distribute material evenly on the plates allow maximum contact



Fungal culture 3

- ◉ incubate face up at room temperature 26°C, >30%RU for up to 4 weeks
- ◉ read every day, positive if DTM turns red
- ◉ red colour should appear TOGETHER - not after- mycelial growth
- ◉ pigmented fungi are not dermatophytes
- ◉ ATTENTION: - some saprophytic fungi are positive
 - some dermatophytes are negative
 - do microscopic identification of fungi

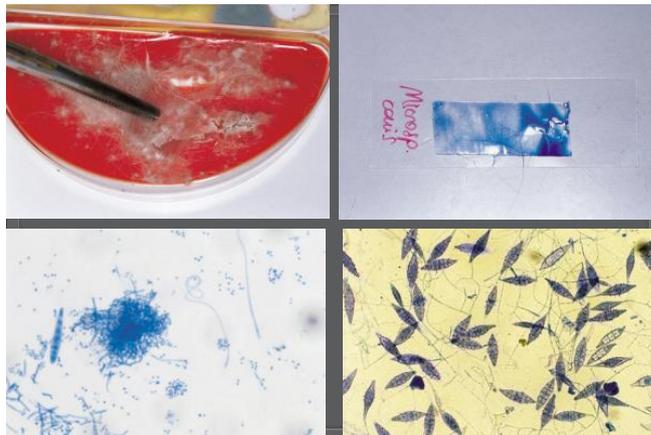
Fungal culture 1

- ◉ double culture plates with Dermatophyte Test Medium (DTM) and Sabouraud's dextrose with cycloheximide and chloramphenicol
- ◉ DTM: - phenol red as indicator (acids produced by catabolism of proteins)
 - inhibits saprophytic fungal growth
- ◉ Sabouraud: - allows better evaluation of fungal colour and macroconidia
 - inhibits saprophytic moulds and bacteria




Macroscopic identification of fungi

- ◉ *M. canis* filamentous colony, white (front) to yellow-orange (rear) cottony or wooly flat mycelium



Macroscopic identification of fungi

- ◉ *Trichophyton mentagrophytes* has a thick downy colony, cream or pale brown (front) and yellow, rose, vine to reddish brown (rear), powdery and granular, with radiations



Treatment

Microscopic identification

- ◉ use colonies at least 5 days old
- ◉ press clear acetate tape on colony
- ◉ put on a drop of lactophenol blue on a slide
- ◉ look carefully at 10x and 40x
- ◉ ATTENTION:
 - some *M. canis* do not produce macroconidia
 - macroconidia of *T. mentagrophytes* are difficult to find → look for spiral shaped hyphae

Should we treat?

- ◉ Contagion to other animals and to humans
 - Up to 50% of exposed humans
 - In up to 70% of the households some infected human
 - A problem in small children and in old, ill and/or immunosuppressed people



Therapeutic approach – CCATS (Moriello JFMS 2014)

- ◉ C - Confinement
- ◉ C - Cleaning
- ◉ A - Assessment
- ◉ T - Topical therapy
- ◉ S - Systemic therapy

ENDPOINT OF THERAPY:
clinical cure, mycological cure and
decontaminated environment

THERAPY
SUCCESS

C - cleaning

- ◉ Desinfectant for environment
 - Sprayed on surfaces after cleaning
 - Household bleach 1:10-1:100
 - Lime sulphur
 - Enilconazole
- Clorhexidine and Virkon S are not as effective

C - confinement

- ◉ preferably confinement to a washable room for the first 2 weeks of systemic and topical therapy (e.g. bathroom)
 - It avoids spreading of the spores to the environment
 - Spores are able to survive over 18-24 months
 - Risk of false positive control fungal culture
- ◉ May be problematic in puppies or kittens
 - Socialization is very important early in life

A - assessment

- ◉ First assessment after 4 weeks of therapy
- ◉ **Weekly** assessments thereafter
 - Wood's lamp → if positive remove fluorescent hair
 - Fungal culture – keep for at least 21 days
- Stop treatment after...
 - 2 consecutive negative cultures single animals
 - 3 consecutive negative cultures multi-animal households

C - cleaning

- ◉ Contamination is always present in homes with affected cats and in 50% of those with affected dogs → risk of false positive fungal cultures
- ◉ Cleaning and desinfection twice weekly
 - Standard mopping and vacuum-cleaning a large amount of spores
 - Vapour machines destroy spores easily
 - Clothes and tissue can be washed in water twice – do not overfill the machine

T – topical therapy

- ◉ Is clipping always necessary?
 - It removes an important source of environmental contamination
 - It removes infected tips of hairs, after hair regrowth → decrease of false positive control cultures
- Makes topical therapy easier
- Decreases duration and cost of treatment by obtaining sooner negative cultures

T – topical therapy

◉ Is clipping always necessary?

HOWEVER....

- In cats sedation is nearly always necessary
- Clippers can cause microtrauma that favour fungal infections



T – topical therapy

Active ingredients

- Lime sulphur 1:16-1:32 dips: preferable due to low toxicity
 - BUT stains white coats, bad odour, irritant to mucosae
- Enilconazole 0,2% lotion: not registered in cats
- Myconazole 2% + chlorhexidine 2% shampoo: synergistic
- Climbazole 0,5% mousse: cats that cannot be wetted
- Other imidazoles shampoo or lotion
- Accelerated H₂O₂ (AHP™, USA, Ca)



Not advised: chlorhexidine, povidiodine, creams

T – Topical therapy

◉ Indication:

- all culture positive animals
- animals in which culture results are pending

◉ Goal:

- kills spores on the coat (hair outside of the body)
- physically removes infected hair, crusts, scales
- ↓spore diffusion → ↓false positive cultures results
- ↓duration and cost of therapies

◉ HOWEVER big compliance problems!!!

T –Topical treatment

◉ How to apply topical therapy

- Treat twice weekly until two/three consecutive weekly fungal cultures
- Allow a 3-10 minutes contact time
- Do not rinse products which are not shampoos:
 - Lyme sulphur dip, eniconazole or other imidazole lotions, climbazole mousse
- It is not always necessary to put an E-collar until dry: Moriello noticed no side effects or oral lesions in shelter cats treated repeatedly topically (JFMS 2014)



S – systemic treatment

◉ **Always** necessary in infected animals

- Kills fungi in the hair follicle (inside the animal)
- Until two/three consecutive weekly fungal cultures

◉ Active ingredients

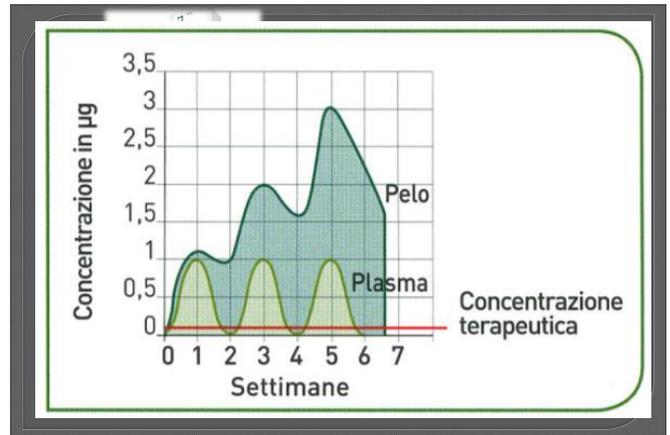
- Griseofulvin
- Ketoconazole,
- Itraconazole,
- Terbinafine





Griseofulvin

- ◉ Micronized griseofulvin 25-50 mg/kg BID
 - fungistatic → needs the help of the immune system → avoid in young or immunosuppressed animals
 - give with fat food to increase absorption
 - teratogenic, do not give in first 40 days of pregnancy
 - rare gastrointestinal and hematologic side effects (myelosuppression in FIV+ cats and in selected breeds – Himalayan, Siamese and Abyssinian)
 - active in stratum corneum for 36-72 hours, moderate keratin binding (37%) → not suitable for pulse therapy



Ketoconazole

- ◉ Ketoconazole 10-20 mg/kg once daily
 - fungistatic → use in immunocompetent animals
 - inhibits the synthesis of ergosterol in the cell membranes → can inhibit the adrenal gland
 - must be given with an acid meal
 - may cause anorexia and vomit, may be hepatotoxic → check liver in animals >5 years of age
 - contraindicated in pregnancy and < 6 weeks of age
 - not suitable for pulse therapy



Terbinafine

- ◉ Terbinafine: 20 mg/kg BID or 40mg/kg SID
 - fungicidal, not teratogenic
 - associated with facial pruritus in cats at high dose
 - it accumulates in high concentrations in sebum, stratum corneum and hair follicles and persists for over 5 weeks after drug withdrawal → suitable for alternate day or alternate week therapy like itraconazole
 - BUT... no real advantage over itraconazole and oral formulation not registered for animals



Itraconazole

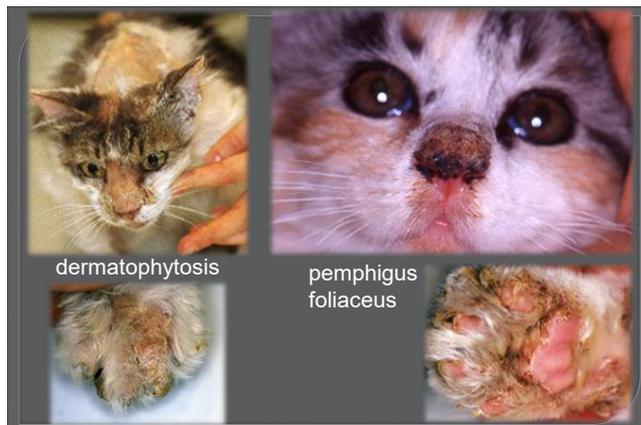
- ◉ Itraconazole 5-10 mg/kg once daily
 - fungicidal → can be used in young, ill animals
 - can be used in small mammals 5-25mg/kg/day
 - mechanism of action similar to ketoconazole
 - better tolerated, particularly by cats
 - increase in ALT correlates with toxicity: if > 200 UI/l decrease dosage of itraconazole
 - It concentrates in keratin and sebum, 97% keratin binding → suitable for alternate day or alternate week treatment, better if after 2-4 weeks of daily treatment

Posaconazole and voriconazole

- ◉ Oral triazole antifungal agents not registered in animals (posaconazole only as an otic product)
- ◉ Broad spectrum activity with superior efficacy
- ◉ Higher safety margin, fewer drug interactions and narrower toxicity profile
- ◉ Posaconazole delayed release oral tablets at 5mg/kg every other day with achieve effective antifungal concentration (Kendall & Papich AJVR 2015)
- ◉ Much more expensive!

Treatment of pregnant animals

- ◉ treat mother with topical therapy during the whole pregnancy and after delivery
- ◉ start terbinafine in the last two weeks of pregnancy, continue after parturition
- ◉ treat newborns with topical therapy until 6 weeks of age
- ◉ start systemic itraconazole therapy at 6 weeks



dermatophytosis

pemphigus foliaceus

Causes of failure

- ◉ Wrong diagnosis!
 - Clinical diagnosis without ancillary testing
 - In dogs: multifocal alopecia is most frequently a demodicosis or a bacterial folliculitis
 - In cats: crusty scaly lesions on face and extremities can be pemphigus foliaceus
 - Wrong interpretation of fungal culture results
 - Late colour development of DTM cultures by saprophytic fungi

Causes of failure

- ◉ Mistakes in treatment
 - Lack of owner compliance
 - Refusal to shave long haired animals or animals with extensive lesions
 - Errors in drug dosage, administration and intervals
 - Too short duration of therapy, lack of correct monitoring and assessment
- ◉ Concomitant debilitating diseases or immunosuppressive treatments



Dermatophytosis

Demodicosis

Causes of failure

- ◉ Reinfection
 - From other affected animals (or environment)
- ◉ Environmental contamination
 - False positive cultures
 - Usually with low CFU
 - No clinical lesions and Wood's lamp negative
 - Alternate positive – negative culture results

Some references and guidelines



(2011)

- Guidelines on superficial mycoses in dogs and cats

Journal of Feline Medicine and Surgery

<http://jfm.sagepub.com/>

- Dermatophytosis in Cats: ABCD guidelines on prevention and management (Frymus et al 2013)
- Feline dermatophytosis: Aspects pertinent to disease management in single and multiple cat situations (Moriello 2014)

THANK YOU!
QUESTIONS?

FELINE SKIN PARASITES



Feline skin parasites

DR. CHIARA NOLI, DIP ECVD
SERVIZI DERMATOLOGICI VETERINARI
PEVERAGNO (CN)



Main parasites

Arachnida

- ticks
- Trombicula
- Cheyletiella
- Notoedres
- Otodectes

Insects

- lice
- fleas
- mosquitos



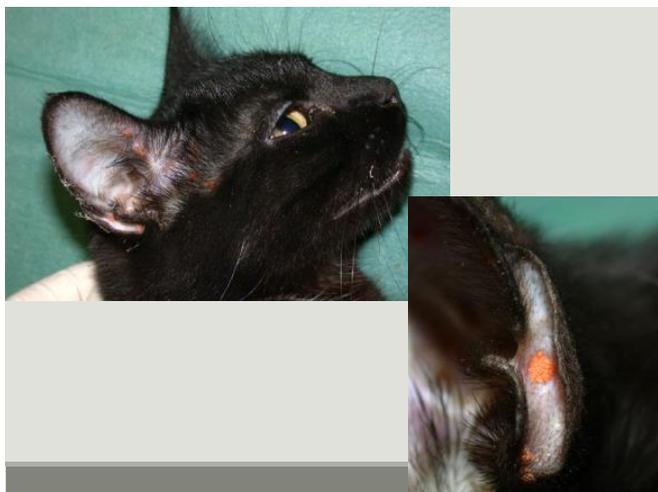
Trombicula

- several generations from March to October
- peak in the late summer and autumn
- in fields, gardens, woods, sunny and dry
- crusts, irritation, pruritus, dermatitis
- bilateral symmetrical alopecia



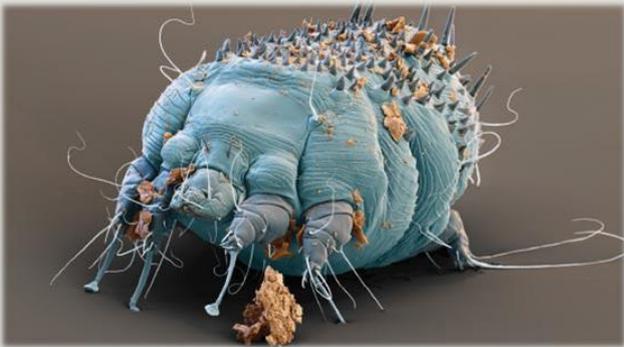
Trombicula

- adults live free in the environment in decaying material, eat other mites
- parasite is its hexapode larva
- can be seen with naked eye
- up to 1mm if fed
- orange-red colour



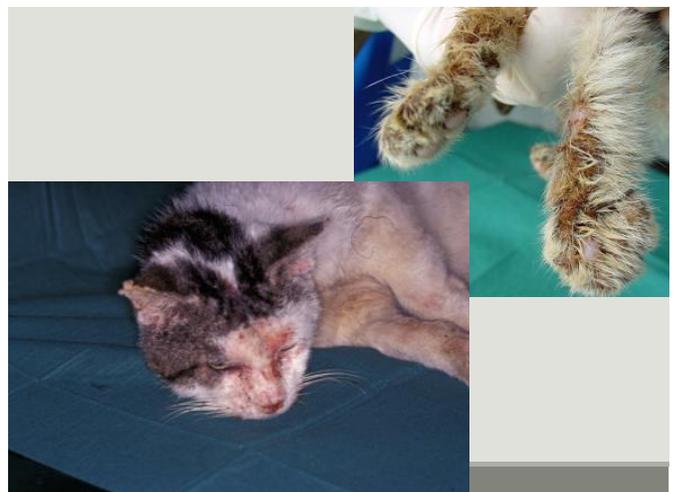


Notoedres cati



Notoedres cati

- 0,25 mm in length, cannot be seen with naked eye
- contagion from infected cats
- whole life cycle on the host
- females dig tunnels in the horny layer, lay eggs and eats epidermal debris and tissue fluids



Otodectes cynotis

- Classic ear mite
- Lives its whole cycle in the ear canals
- Cannot be seen on a naked eye

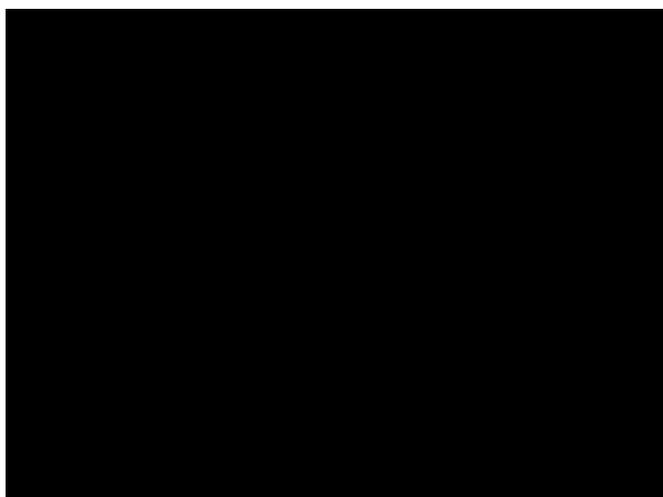


Otodectes

- Very contagious between cats, dogs, ferrets, particularly at young age
- Bilateral otitis, typical brown dry exudate
- Very pruritic
- If not treated can cause more severe forms of otitis
- Can also be cause of dermatitis



Otodectes cynotis



Cheyletiella

- Parasite of cats, dogs and rabbits
- Very contagious to other animals and humans
- More frequent in catteries and shops
- Can be seen with a magnifying lens

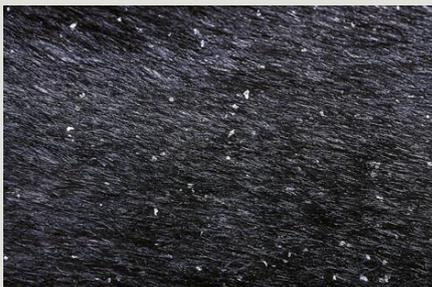


Cheyletiella

- Variable pruritus and scales on the back
- In persian cats can be associated with mycosis
- Very pruritic for owners



Cheyletiella spp.



Lice

- Biting lice *Felicola subrostrata*
- Affects only the cat
- Nits adhere strongly to the hair
- They can easily be seen with naked eye



Lice

- Contagion from other infected cats
- Usually young or ill animals
- Pruritus, skin lesions, poor coat quality



Demodex cati – in hair follicles



Demodex gatoi – on the stratum corneum

Treatment and prevention

Ticks, Trombicula and lice: Frontline®

Notoedres, Cheyletiella and Otodectes: Stonghold® Stonghold Plus® or Advocate®

For all parasites: isoxazolines (Bravecto®)

Avoid introduction of foreign cats without treatment and quarantine

Treat before and after mating, exhibition

Environmental control



Feline demodicosis

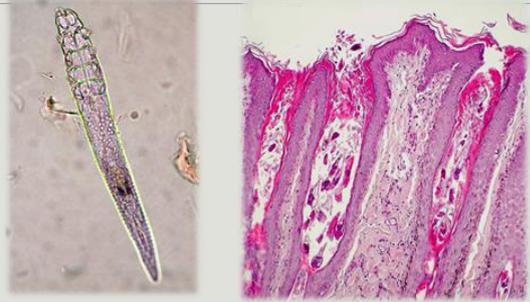
Quite uncommon

Caused by different species:

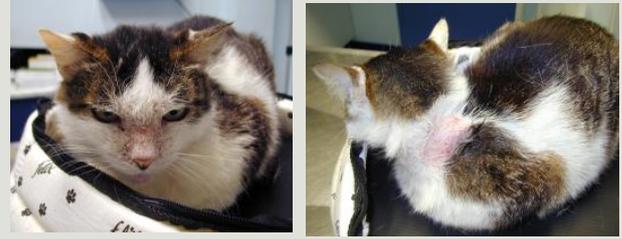
- Demodex cati* (long form)
- Demodex gatoi* (short form)
- A third possible unnamed species with intermediate length



Demodex nel gatto – *D. cati*



Demodex cati Nei follicoli piliferi



Generalized form

Feline demodicosis

Localized form

- Especially on the face
- Nose, periocular
- Ceruminous otitis

Generalized form

- Nearly always an underlying disease
 - diabetes, Fiv/Felv, neoplasia, toxoplasmosis, immunosuppressive therapies

Prognosis depends on the underlying cause



Generalized form

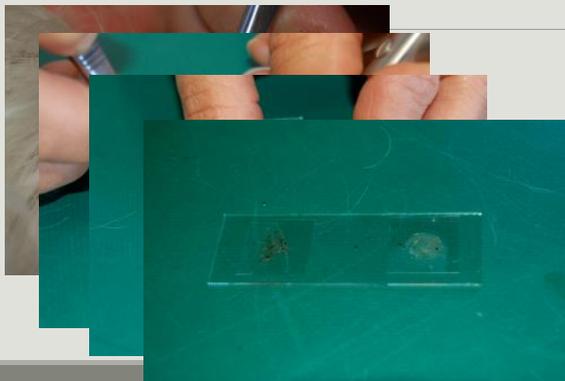


Localized form

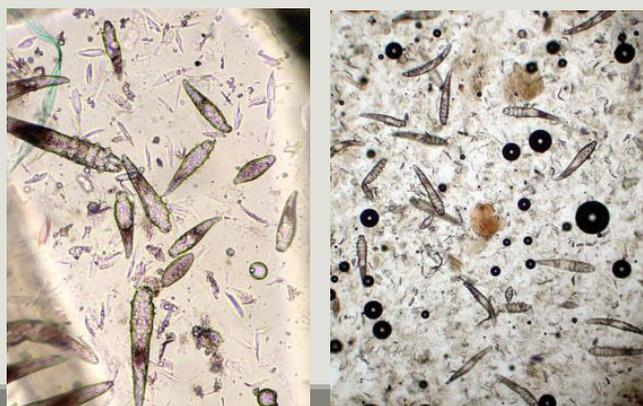
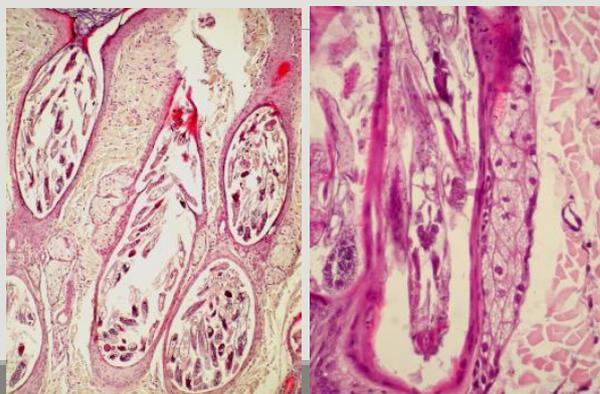
Trichoscopy



Deep skin scraping



Skin biopsy



Demodicosis da *D. gatoi*

Pruritic and contagious



Saari et al, 2009

Demodex gatoi



Demodex gatoi In the stratum corneum

Fluralaner and *Demodex*



Dr. Maina e
Dr. Matricoti



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combo
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milbemicin oksim, prazikvantel

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Ataxxa[®]
imidaklopid, permetrin
 NE UPORABITE ZA ZDRAVLJENJE MAČK.

Prinocate[®]
moksidektin, imidaklopid

Samo za strokovno javnost. Celotni povzetki glavnih značilnosti zdravil so objavljeni na www.krka.si.

 KRKA

FELINE ALLERGY

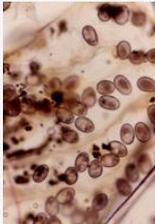
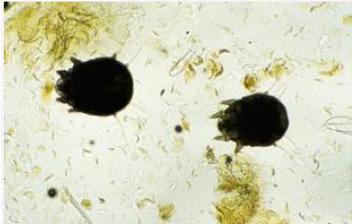
FELINE ALLERGY
 CLINICAL PRESENTATION
 AND DIAGNOSTIC APPROACH

Dr. Chiara Noli, DVM, Dip ECVD
 Servizi Dermatologici Veterinari
 Peveragno (CN), Italy

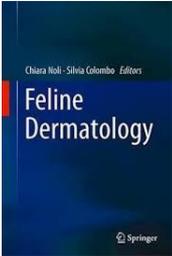


NOTOEDRES CATI



WHO LIKES CATS?

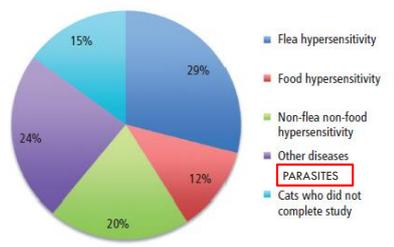




CHEYLETIELLA SPP




PRURITUS IN CATS

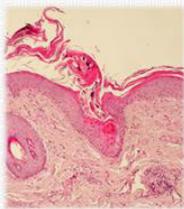



Cause	Percentage
Flea hypersensitivity	29%
Food hypersensitivity	12%
Non-flea non-food hypersensitivity	20%
Other diseases	24%
Cats who did not complete study	15%
PARASITES	0%

Figure 34.1 Causes of pruritus in 502 cats (Hobi et al. 2011 [1]).

DEMODEX GATOI



Scari et al, 2009

FLEAS AND FLEA BITE ALLERGY



- usually adult cats – particularly cats frequently exposed to fleas!!!
- not to be excluded if no fleas or dirt are found: cats are able to rapidly ingest fleas



LESIONS ASSOCIATED WITH FELINE ALLERGY

- Self-induced alopecia 40-100%
- Excoriations head and neck 30-65%
- Miliary dermatitis 21-40%
- Eosinophilic dermatitis 6-23%
 - Eosinophilic plaque, granuloma, lip ulcer



FOOD ALLERGY

- Pruritus ~ 100%
- Generalised ↓ frequent
 - Head and face 53%
 - Ears 18-54%
 - Abdomen 25-66%
 - Paws 6-33%

Critically appraised topic on adverse food reactions of companion animals (7): signalment and cutaneous manifestations of dogs and cats with adverse food reactions

Veterinary Dermatology

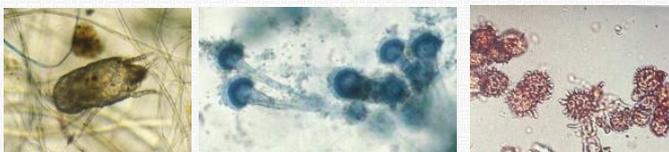
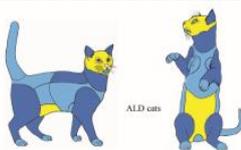
Clinical characteristics and causes of pruritus in cats: a multicentre study on feline hypersensitivity associated dermatoses

Stefan Heide, Monika Linsek, Genevieve Margnac, Thierry Othry, Luc Bécot, Claudia Heit, Jacques Fontaine, Patra Flogea, Kerstin Bergvall, Saira Bekou, Stefanie Koebich. See all authors



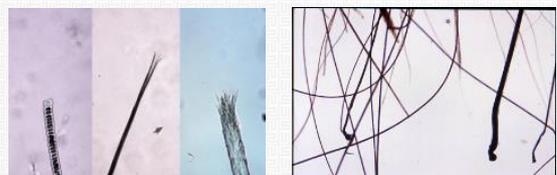
ATOPIC DERMATITIS

- Allergy against pollen, molds, mites, epithelia
- Average 2-3 years, 62-72% of cats < 3 yrs
- Seasonal in 10-20% of cases



BILATERAL SYMMETRICAL ALOPECIA

- diagnosis with trichogramme
 - anagen roots and broken tips
- histology (nearly) normal skin



DIFFERENTIALS

- Psychogenetic alopecia
- Licking due to pain: cystitis, osteoarthritis
- Cushing's disease
- Paraneoplastic alopecia

DIFFERENTIALS

- Notoedric mange
- Ectopic otodectic mange
- Pemphigus foliaceus
- Dirty face disease
- Herpes virus dermatitis
- Idioathic ulcerative dermatitis



Cushing's syndrome



From Heripret and Kooistra: Hormonal and metabolic dermatoses in cats. In Feline Dermatology, Noli and Colombo Eds, Springer 2020



Paraneoplastic alopecia



Notoedres – Photo Dr. F. Leone



Dermatophytosis



Excoriations head and neck



pemphigus foliaceus



dirty face disease of the persian cat



Viral – Dr. F. Scarpella

PRURITUS ON HEAD AND NECK

“Neck lesion”: deep ulceration on the head and neck

- an allergic cause is not always found – often idiopathic – psychogenic?



Front Vet Sci. 2018; 5: 81
 Published online 2018 Apr 16. doi: 10.3389/fvets.2018.00081
 PMID: PMC5911
 PMID: 29713
From Feline Idiopathic Ulcerative Dermatitis to Feline Behavioral Ulcerative Dermatitis: Grooming Repetitive Behaviors Indicators of Poor Welfare in Cats
 Emmanuelle Thoux¹, Caroline Gilbert^{1,2}, Amélie Briand^{3,4} and Noëlle Cochet-Falgaux^{3,4,5*}



Eosinophilic plaque

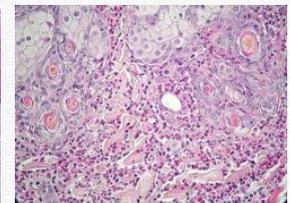
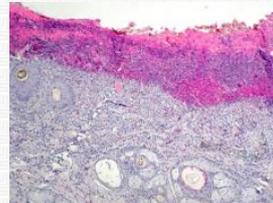
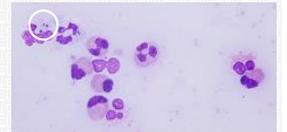


Miliary dermatitis



EOSINOPHILIC PLAQUE

- Cytology: eosinophils, bacteria
- Histology: similar to miliary dermatitis

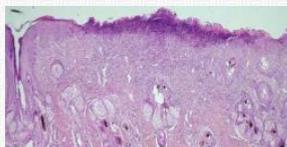
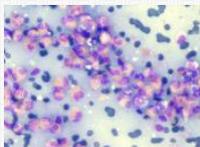


MILIARY DERMATITIS

- Exclusion of dermatophytosis
 - Trichogramm, Wood's lamp, fungal culture
- Cytology: eosinophils
- Histology: eosinophilic infiltrate and crusts

RARE DIFFERENTIAL

Dermatophytosis



DIFFERENTIALS

- Diseases with plaques
 - Xanthomatosis
 - Multicentric mast cell tumours
- Disease affecting the abdominal skin
 - Pemphigus foliaceus
 - Erythema multiforme
 - Mycobacterial/atypical bacterial infection
 - Angiosarcomas





EOSINOPHILIC GRANULOMA

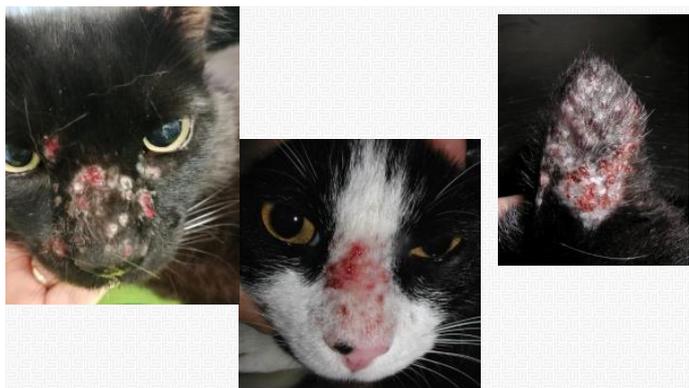
Histology: eosinophilic "mush" with giant cells

Indolent / lip ulceration

DIFFERENTIAL DIAGNOSIS

- Xanthomatosis
- Nodular skin infections (e.g. deep mycoses)
- Skin and mouth tumours (e.g. squamous cell carcinoma)

MOSQUITO BITE ALLERGY



COMPLICATING INFECTIONS IN CATS

Much less frequent in the allergic cat than in the allergic dog

Difference:

- Epidermal barrier
- Microenvironment and skin flora
- Immune system
- Decreased adherence of staphylococci to feline corneocytes, compared to humans and dogs



PYODERMA IN CATS

S. pseudintermedius or *S. aureus* are normal inhabitants of feline skin

Pasteurella multocida due to oral contamination

Often infection of self-induced lesions

- Head and neck pruritus → excoriations
- Eosinophilic plaques, ulcerated granulomas

Bacterial folliculitis (as in dogs) is rare

- More often seen in cats treated with steroids



PYODERMA IN THE CAT (YU AND VOGELNEST, 2012)

Face (62%) and neck (37%) often involved

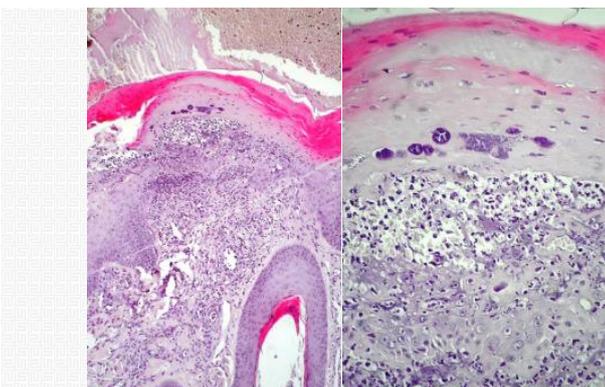
Pruritus in 92% of cases

Underlying allergy in 60% of cases

50% of allergic cats has a pyoderma

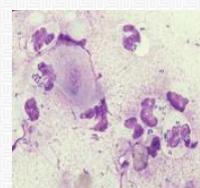
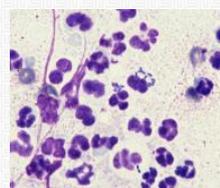
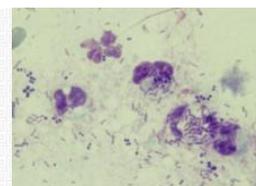


DIAGNOSIS



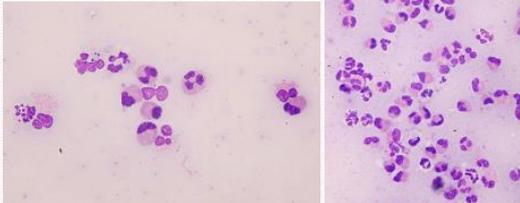
DIAGNOSIS

Bacteria in neutrophils



DIAGNOSIS

Possible presence of both eosinophils and bacteria



MALASSEZIA DERMATITIS IN THE CAT

30% of cats with generalised Malassezia has an allergy,
70% has severe systemic diseases, wick as viral infections,
paraneoplastic syndromes, thymoma, diabetes, metabolic
epidermal necrolysis

Only 7% of allergic cats has a Malassezia dermatitis (!!!)

MALASSEZIA IN THE CAT

Multifocal to generalised dermatitis

- Alopecia, hair breaks easily
- Erythema, hyperpigmentation
- Waxy greasy scales, follicular casts
- Pruritus



ORDEIX ET AL, VET DERM 2007

Malassezia dermatitis in 18 allergic cats

- Face 61%
- Ventral neck 33%
- Abdomen 33%
- Ears 22%

Good results, ↓ pruritus with:

- Itraconazole or ketoconazole 5-10mg/kg/day
- +/- antibiotics (for mixed infections)
- +/- topical therapy with chlorhexidin





Linkskin®

RAVNOVESJE ČREVESNE IN KOŽNE MIKROBIOTE.

- **Linkskin® pršilo** s kombinacijo svojih sestavin deluje neposredno na kožo tako, da preprečuje in odpravlja spremembe na koži (npr. atopijski dermatitis), saj spodbuja ravnovesje kožne in črevesne mikrobiote, krepi imunski sistem in deluje kot antioksidant. To je idealen izdelek za preprečevanje ter zmanjševanje srbenja in klinično izraženih učinkov pri alergijskem in atopijskem dermatitisu pri psih in mačkah.
- **Linkskin® tablete** s kombinacijo svojih sestavin delujejo od znotraj tako, da preprečujejo in odpravljajo spremembe na koži (npr. atopijski dermatitis), saj spodbujajo ravnovesje kožne in črevesne mikrobiote, krepijo imunski sistem in delujejo kot antioksidant.



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FOOD ALLERGY IN CATS

FOOD ALLERGY IN CATS: DIAGNOSIS AND CONTROL

Dr. Chiara Noli, DVM, Dip ECVD
 Servizi Dermatologici Veterinari
 Peveragno (CN), Italy



BREED PREVALENCE

Persian 5%,
 Siamese 4%,
 Burmese 2%



PREVALENCE

It is usually estimated that more or less one fifth of the cats with pruritus have an allergic food reaction

Prevalence among all cats which....	
...were brought to the clinic	0,2%
...have skin disease (any)	3-6%
...have pruritus	12-21%
...are allergic	5-13%

Critically appraised topic on adverse food reactions of companion animals (3): prevalence of cutaneous adverse food reactions in dogs and cats
Thierry Olivry¹ and Ralf S. Mueller²

ALLERGENS

Allergen	cat
Bovine	18%
Fish	17%
Chicken	5%
Dairy products	4%
Wheat	4%
Corn	4%
Lamb	3%

Food trials with single ingredient provocation tests

Critically appraised topic on adverse food reactions of companion animals (2): common food allergen sources in dogs and cats
Ralf S. Mueller¹, Thierry Olivry² and Pascal Prélaud³

PREVALENCE OF AGE AND SEX

	Cat
Age range	A few months – 15years
Average	3,9 years
< 6 months	9%
< 12 months	23%
F/M ratio	1,5



Critically appraised topic on adverse food reactions of companion animals (3): prevalence of cutaneous adverse food reactions in dogs and cats
Thierry Olivry¹ and Ralf S. Mueller²

DERMATOLOGICAL SIGNS

Pruritus ~ 100%

- Generalised ↓ frequent
- Head and face 53%
- Ears 18-54%
- Abdomen 25-66%
- Paws 6-33%

Critically appraised topic on adverse food reactions of companion animals (7): signalment and cutaneous manifestations of dogs and cats with adverse food reactions
Thierry Olivry¹ and Ralf S. Mueller²

Veterinary Dermatology

Clinical characteristics and causes of pruritus in cats: a multicentre study on feline hypersensitivity-associated dermatoses

Stefan Hock, Monika Linak, Genevieve Mangiac, Thierry Olivry, Luc Bécot, Claudia Hett, Jacques Fontaine, Petra Rooze, Veronik Bergquist, Susa Betova, Stefanie Koenrich ... See all authors



CAFR cats

DERMATOLOGICAL SIGNS

Lesions

- Self-induced alopecia 40-100%
- Excoriations head and neck 30-65%
- Miliary dermatitis 21-40%
- Eosinophilic dermatitis 6-23%

Critically appraised topic on adverse food reactions of companion animals (7): signalment and cutaneous manifestations of dogs and cats with adverse food reactions

Therapy Chay[®] and Nat's Mueller[™]



Miliary dermatitis



Self-induced alopecia



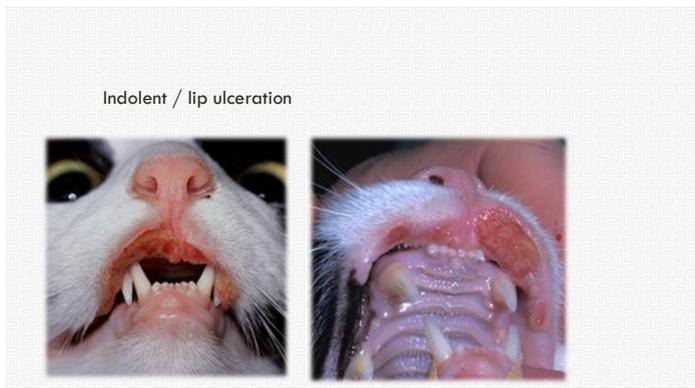
Eosinophilic plaque



Excoriations head and neck



Eosinophilic granuloma



DIFFERENTIAL DIAGNOSES OF ADVERSE FOOD REACTIONS

Pruritic skin diseases:

- Parasitic
- Allergic
- Infectious



GASTROINTESTINAL SIGNS THE PREVALENCE DEPENDS ON THE AUTHOR OF THE ARTICLE

Critically appraised topic on adverse food reactions of companion animals (6): prevalence of noncutaneous manifestations of adverse food reactions in dogs and cats
 Ralf S. Mueller and Thierry Olivry

Cats	Only skin	Skin + GE	Only GE
Authors are dermatologists	77%	20%	2%
Authors internists or gastroenterologists	28%	26%	49%

DIAGNOSTIC APPROACH OF PRURITUS

1. Ectoparasitic infestations
- ↓
2. Complicating infections
- ↓
3. Food allergy
- ↓
4. Atopic dermatitis



NONCUTANEOUS SIGNS

Of all noncutaneous signs	Cat
Diarrhea	28-55%
Vomit	29-52%
Conjunctivitis	3-22%
Rhinitis	4%
Sialorrea	1-20%

Critically appraised topic on adverse food reactions of companion animals (6): prevalence of noncutaneous manifestations of adverse food reactions in dogs and cats
 Ralf S. Mueller and Thierry Olivry



PARASITES - DIAGNOSIS BY TREATMENT

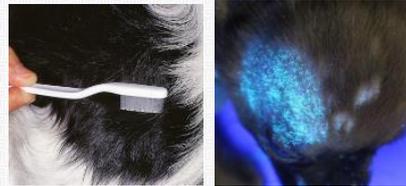
For all skin parasites...

- Isoxazolines
 - Fluralaner
 - Lotilaner
 - Sarolaner
- Macrocyclic lactones
 - Selamectin
 - Moxidectina/imidacloprid spot on
 - Eprinomectin/fipronil/(S)-methoprene



COMPLICATING INFECTIONS IDENTIFICATION

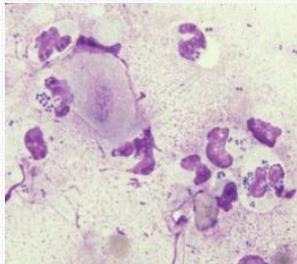
- Cytology
 - Bacteria in neutrophils → pyoderma
 - Yeasts → *Malassezia*



Dermatophytosis

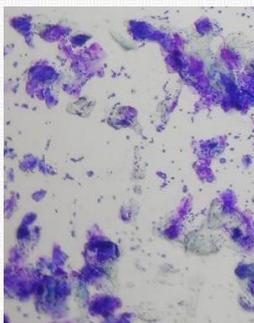


Intracellular cocci

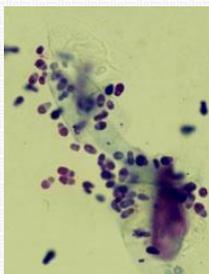


DIAGNOSTIC APPROACH OF PRURITUS

1. Ectoparasitic infestations
2. Complicating infections
3. Food allergy
4. Atopic dermatitis



Malassezia



SERUM TESTS ARE NOT ABLE TO DIAGNOSE ADVERSE FOOD REACTIONS

Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests?
Noli, Mariani, and Neri 2017

They measure IgE specific for food allergens

- BUT: not all patients with adverse food reaction produce IgE
- Some have non-immunologic reactions, others have a type IV cell-mediated reaction, and a not type I antibody-mediated reaction

Low repeatability, low accuracy (20%)

Often positive in healthy cats or those with other allergies

→ Are not able to identify cats with adverse food reactions

SERUM TESTS ARE NOT ABLE TO DIAGNOSE ADVERSE FOOD REACTIONS

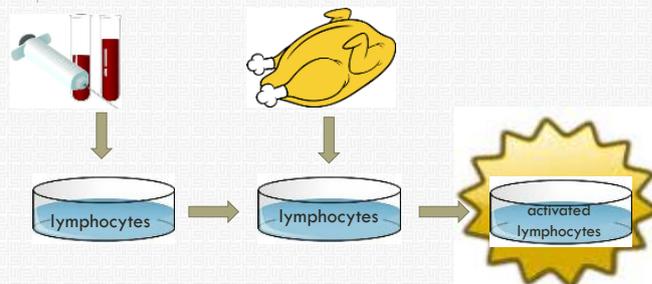
If compared to the results of the dietary provocation tests, serum tests have....

- Positive predictability 0%
- Negative predictability 20%

Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests?
RAF S. Mueller* and Thierry Olivry†

Problems due to identification of antigens after cooking, processing and digestion of foods, and due to cross reactions

LYMPHOCYTE PROLIFERATION TEST



IN VITRO CROSS REACTIONS



Veterinary Dermatology

Ver Dermatol 2018; 30: 25-e8

DOI: 10.1111/vde.12691

Serum IgE cross-reactivity between fish and chicken meats in dogs

Jennifer Bexley*, Nicola Kingswell* and Thierry Olivry†§

and unrelated food allergens in dogs – a serological study

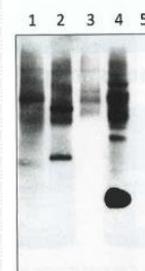
Jennifer Bexley*, Timothy J. Nuttall†, Bruce Hammerberg‡ and Richard E. Halliwell†

TEST FOR THE CHOICE OF THE DIET

Feli-Dial® Western Blot

Determination of the presence of allergen-specific IgE against commercial foods or pure ingredients

- It is possible to test up to 5 diets
- Useful for the choice of the elimination diet
- Good reliability



LYMPHOCYTE PROLIFERATION TEST RESULTS ARE MORE RELIABLE

If compared to the results of the dietary provocation tests, these tests have....

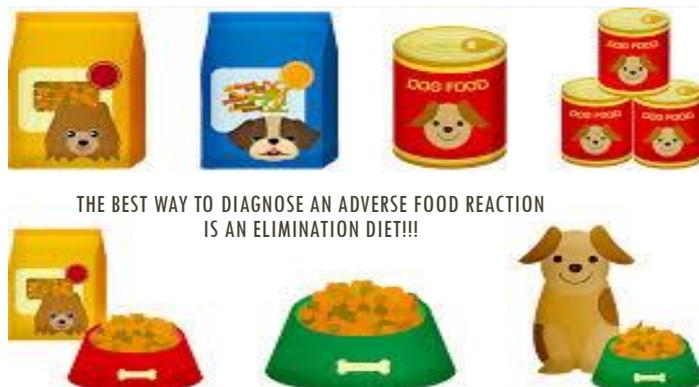
- Positive predictability 100%
- Negative predictability 50%

Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests?
RAF S. Mueller* and Thierry Olivry†

Journal of Veterinary Medical Science

Lymphocyte Blastogenic Responses to Food Antigens in Cats Showing Clinical Symptoms of Food Hypersensitivity

Rinrei ISHIDA, Keigo KURATA, Kenichi MASUDA, Koichi OHNO, Hajime TSUJIMOTO

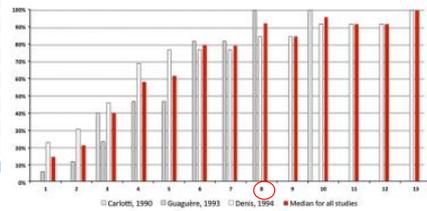


HOW LONG SHOULD A DIET LAST?

- 3 weeks: 40%
- 5 weeks: 60%
- 8 weeks: 92%
- 10 weeks 95%

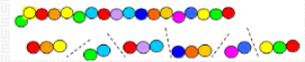
Critically appraised topic on adverse food reactions of companion animals (1): duration of elimination diets

Thierry Olivry^{1,2*}, Jeff S. Mueller³ and Priscil Heuser⁴



HYDROLYSATE DIETS

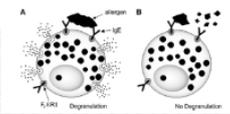
Proteins hydrolysed in peptides or single aminoacids
Too small to be recognised by the immune system
Ideally <5-6 kD



RESEARCH ARTICLE BMC Veterinary Research

Extensive protein hydrolyzation is indispensable to prevent IgE-mediated poultry allergen recognition in dogs and cats

Thierry Olivry^{1,2*}, Jennifer Beasley³ and Isabelle Mougeot⁴



HOME COOKED OR COMMERCIAL?

Against home cooked

Home cooked diets based on limited antigens are not balanced

- Deficiency of taurine, trace elements and vitamins
- 6-9 ingredients are necessary to prepare a balanced recipe

Only 13% of owners comply with prescribed recipes

- Problems of time and difficulty of preparation
- Financial reasons
- Change of ingredients or doses



Against commercial

Some cats can eat home cooked ingredients and react to a commercial diet based on the same ingredients

Limited antigen diets can be contaminated with proteins not reported on the label



THE IMPORTANCE OF USING STARCH

- 29 cats with IgE for whole corn
- 20 recognize corn flour
- No cat recognises starch



RESEARCH ARTICLE BMC Veterinary Research

Cornstarch is less allergenic than corn flour in dogs and cats previously sensitized to corn

Thierry Olivry^{1,2*} and Jennifer Beasley³

Detection of undeclared animal by-products in commercial canine canned foods: Comparative analyses by ELISA and PCR-RFLP coupled with slab gel electrophoresis or capillary gel electrophoresis

Ming-Kun Hsieh¹, Pei-Yin Shih², Chia-Fong Wei³, Thomas W Vickroy⁴ and Chi-Chung Chou^{1*}

80% of canned food contaminated

Investigation into the animal species contents of popular wet pet foods

Isabella F. Mareo¹, Robert Attenbury and Xin-Chow Chang^{2*}

14/17 canned food contaminated

Identification of undeclared sources of animal origin in canine dry foods used in dietary elimination trials

R. Ricci¹, A. Granato², M. Vascellari², M. Boscarato², C. Palugiano¹, I. Andrighetto^{1,2}, M. Diez³ and F. Mutinelli^{4*}

10/12 elimination diets contaminated

Detection of DNA from undeclared animal species in commercial elimination diets for dogs using PCR

Christa Horvath-Ungerboeck¹, Karoline Widmann² and Stefanie Handt^{3*}

9/12 elimination diets with undeclared protein sources

A CORRECT DIAGNOSIS IS THE PROBLEM

In order to confirm the diagnosis of adverse food reaction it is important to see:

- Improvement of signs with hypoallergenic diet
- Relapse after provocation with the old food
- A new improvement with the hypoallergenic diet

...not all published studies follow this procedure, often animals improve with the diet but do not relapse upon provocation....



FARMINA ULTRA HYPO

PRELIMINARY DATA NOT YET PUBLISHED

- 26 cats completed the diet
- 18 cats improved = 69%
- 17 cats underwent provocation tests:
 - 9 relapsed → 35% had food allergy
 - 8 did not relapse upon provocation (31% of all cats!)



AGAINST PRURITUS

- 8 weeks of elimination diet is a long period of time
- A long lasting diet is necessary due to the chronicity of the skin lesions and of the intestinal inflammation
- Compliance may be a problem for such a long time if the cat is pruritic
- An antipruritic drug in the first 6-7 weeks helps complete the diet
- Drug withdrawal in the last 1-2 weeks of elimination diet allow the evaluation of the diet results



COMPLIANCE

- Only 40% of owners complies with the instructions
- Bad compliance due to:
 - Low palatability – cat does not eat the diet
 - Impossible to keep the cat at home
- 128 cats prescribed with an elimination diet
- 90 started the diet (70%)
- 78 completed the diet for at least 6 weeks (60%)

Australian VETERINARY JOURNAL THE JOURNAL OF THE AUSTRALIAN VETERINARY ASSOCIATION LTD
Cutaneous adverse food reactions in cats: retrospective evaluation of 17 cases in a dermatology referral population (2001–2011)
 LJ Vogelmeist* and KY Cheng

AGAINST PRURITUS

- (Methyl)prednisolone 0,5-1 mg/kg die
- Oclacitinib NOT REGISTERED IN THE CAT
 - 1 mg/kg every 12 hours
 - For the first 6 or 7 weeks
 - Rapid relapse of pruritus upon withdrawal → correct evaluation of the diet
- Ciclosporin not suitable



Veterinary Dermatology

A double-blinded, randomized, methylprednisolone-controlled study on the efficacy of oclacitinib in the management of pruritus in cats with nonflea nonfood-induced hypersensitivity dermatitis
 Chiara Noli*, Irina Metricotti and Carlo Schlemmer†

FLAVOURED PRODUCTS

- Antiparasitic products in chewable tablets
- Gelatine capsules containing fatty acids
- Vitamins and mineral supplements
- Paste for the removal of hairballs
- Probiotics for animals
- Flavoured antibiotics



JAAHA

Common Confounders of Dietary Elimination Trials Contain the Antigens Soy, Pork, and Beef

Jacqueline M. Pirr, DVM, MS*, Rebecca L. Remillard, PhD, DVM, DACVP†

RECHECK AT DIET END

If pruritus is improved or disappeared:

- Provocation with the old diet as a whole
- Provocation with single food ingredients
- Relapse within a few hours – 10 days

If pruritus is still present:

- Evaluation of diet compliance
- Identification of possible infections/infestations
- Diagnosis of atopic dermatitis**

Ko gre za vnetje zunanjega sluhovoda*, daje Osurnia dodaten odmerek sigurnosti.



Vnetje sluhovoda je lahko kronično. Zato razumemo, da je za uspešno dolgoročno obvladovanje vnetja pomembno, da se razvije zaupanja vreden odnos z lastnikom.

Osurnia vam z drugo aplikacijo zagotavlja dodatno priložnost za ponovni pregled psa na sredini zdravljenja, pri katerem se prepričate ali je odziv na terapijo ustrezen, poleg tega pa pomaga okrepiti odnos z lastnikom.

Dodaten odmerek zagotavlja dodaten pregled.

www.dechra.si/osurnia



Osurnia[®]

We're all ears.

*Zdravljenje akutnega vnetja zunanjega sluhovoda ter akutnega poslabšanja ponavljajočega se vnetja zunanjega sluhovoda, povezanega z bakterijo *Staphylococcus pseudintermedius* in glivico *Malassezia pachydermatis*.
OSURNIA gel za uho za pse. En odmerek (1,2 g) vsebuje: **Učinkovine:** Terbinafin: 10 mg, Florfenikol: 10 mg, Betametazonacetat: 1 mg (kar ustreza bazi betametazona 0,9 mg).

Odmerjanje in način uporabe: Avrikularna uporaba. V vsako vneto uho dajte eno tubo. Dajanje ponovite po 7 dneh. Do največjega kliničnega odziva lahko pride šele po 21 dneh po drugem dajanju. **Kontraindikacije:** Ne uporabite v primerih preobčutljivosti na učinkovine, na druge kortikosteroide ali na katerokoli pomožno snov. Ne uporabite, če je bobnič predrt. Ne uporabite pri psih z generalizirano demodikozo. Ne uporabite pri brejih ali vzrejnih živalih. **Neželene učinki:** Glede na izkušnje po pridobitvi dovoljenja za promet so v zelo redkih primerih poročali o gluhosti ali okvari sluha, večinoma začasni, po uporabi zdravila pri psih, predvsem pri starejših živalih. **Posebna opozorila za vsako ciljno živalsko vrsto:** Ušesa pred prvim dajanjem zdravila očistite. Še 21 dni po drugem dajanju ušes ne čistite ponovno. V kliničnih raziskavah se je za čiščenje ušes uporabljala le fiziološka raztopina. Na notranjem in zunanem delu uhlja se lahko pojavi prehodna mokrota, ki je posledica prisotnosti zdravila, ni pa klinično pomembna. Bakterijsko in glivično vnetje sluhovoda sta pogosto posledica drugih stanj. Pred protimikrobnim zdravljenjem je treba izvesti ustrezno diagnostiko in predvideti zdravljenje vzroka. Pri živalih z anamnezo kroničnega ali ponavljajočega se vnetja zunanjega sluhovoda je lahko učinkovitost tega zdravila zmanjšana, če primarni vzrok, kot je npr. alergija ali anatomska zgradba ušesa, ni obravnavan. **Posebni previdnostni ukrepi:** To zdravilo za uporabo v veterinarski medicini lahko draži oči. Do nenamerne izpostavljenosti oči lahko pride, ko pes strese z glavo med ali takoj po dajanju zdravila. Da bi se lastniki izognili temu tveganju, se priporoča, da se to zdravilo za uporabo v veterinarski medicini daje samo s strani veterinarja ali pod njegovim strogim nadzorom. Da se izognete izpostavljenosti oči, so potrebni ustrezni ukrepi (npr. nošenje zaščitnih očal med dajanjem zdravila, masiranje ušesnega kanala po dajanju zdravila, da se zagotovi enakomerna porazdelitev zdravila, fiksacija psa po dajanju zdravila). V primeru, da pride do nenamerne izpostavljenosti oči, le-te temeljito izpirajte z vodo 10 do 15 minut. Če se razvijejo klinični znaki, se takoj posvetujte z zdravnikom in mu pokažite navodilo za uporabo ali ovojnico. **Za ostale previdnostne ukrepe si preberite navodilo za uporabo. Medsebojno delovanje z drugimi zdravili in druge oblike interakcij:** Kompatibilnost s čistili za ušesa, razen s fiziološko raztopino, ni bila dokazana. **Imetnik dovoljenja za promet:** Dechra Regulatory B.V., Handelsweg 25, 5531 AE Bladel, Nizozemska. **SAMO ZA STROKOVNO JAVNOST. Rp-Vet. Pred uporabo preberite navodilo za uporabo.** Datum priprave oglaševalnega gradiva: 25.11.2020

Za vse nadaljnje informacije o tem zdravilu se obrnite na krajevno predstavništvo imetnika dovoljenja za promet z zdravilom: GENERA SI d.o.o., Parmova ulica 53, 1000 Ljubljana, Tel: +386 1 43 64 466, Email: info.si@dechra.com

GENERA SI d.o.o. je del skupine Dechra Pharmaceuticals PLC www.dechra.si ©Dechra Veterinary Products A/S November 2020

HOW TO SUCCESSFULLY TREAT ALLERGIC CATS



Dr. Chiara Noli
 DVM, Dip ECVD
 Servizi Dermatologici Veterinari
 Peveragno



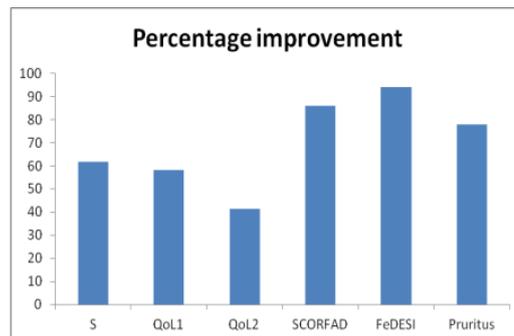
PRURITUS AND QUALITY OF LIFE

Cats with atopic dermatitis	Correlation	
	r	p
QoL cat x pruritus	0.32	0.03*
QoL owner x pruritus	0,33	0,03*

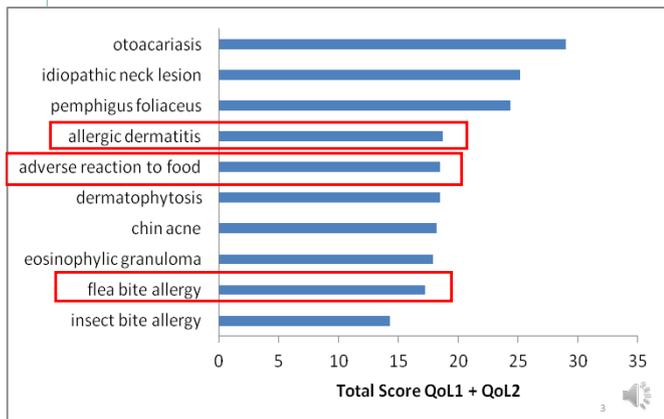
Significant inverse correlation between pruritus and the quality of life of affected cats and that of their owners



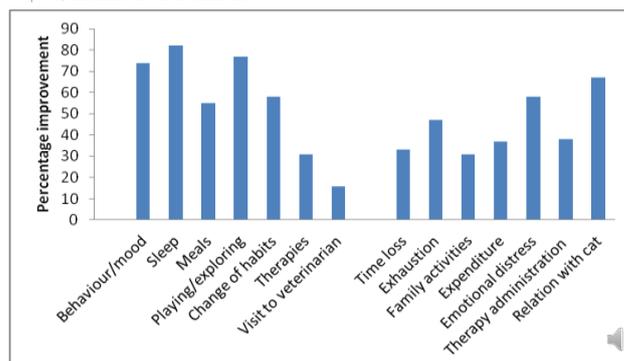
THE IMPACT OF THERAPY ON THE QUALITY OF LIFE



PRURITUS AND QUALITY OF LIFE



THE IMPACT OF THERAPY ON THE QUALITY OF LIFE



COMPLIANCE



SYMPTOMATIC THERAPY



Classic therapeutical options:

- Systemic corticosteroids
- Ciclosporin
- Antihistamines

New alternatives, recent data:

- Oclacitinib
- Maropitant
- PEA
- Others

HOW CAN WE TREAT A CAT WITH PRURITUS?



Veterinary Dermatology

Review | Open Access | CC BY-NC-ND

Treatment of the feline atopic syndrome – a systematic review

Ralf S. Mueller, Tim Nuttall, Christine Prost, Bianka Schulz, Petra Bizikova

First published: 19 January 2021 | <https://doi.org/10.1111/vde.12933>

SYMPTOMATIC THERAPY OF PRURITUS

Reactive therapy

- Gets the flare under control
- Rapid, effective
- Short period of time

Proactive therapy

- Keeps the disease in remission
- Long period of time
- Easy to administer and safe

Allergen-specific immunotherapy

- Aims at reducing or withdrawing medications for pruritus
- Educates the immune system to react in a healthy way to allergens



STEROIDS



- Prednisolone, methylprednisolone 1.5mg/kg
- Triamcinolone 0.1-0.2mg/kg
- For about 7-14 days until remission
- then low dose maintenance every 48h
 - Prednisolone and methylprednisolone max 0.5mg/kg
 - Triamcinolone max 0.15 mg/kg

STEROIDS SIDE EFFECTS

- Glucose intolerance
 - Hyperglycaemia
 - Glycosuria
 - Increased fructosamine
 - Increased amylase
- Skin fragility syndrome
 - Methylprednisolone acetate only if really necessary for severe compliance problems



CICLOSPORIN

- Antiinflammatory and anti-allergic activity
- Inhibits mainly T-cells, but also many other inflammatory cells
- Registered for use in cats 7mg/kg/day
- As effective as corticosteroids (Wisselink et al, 2008)

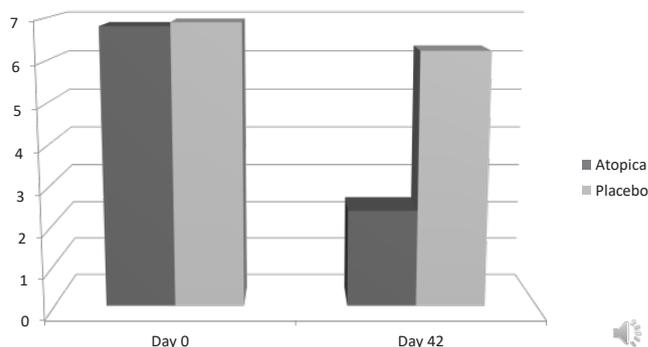


CORTICOSTEROIDS

Avoid repeated depot injections



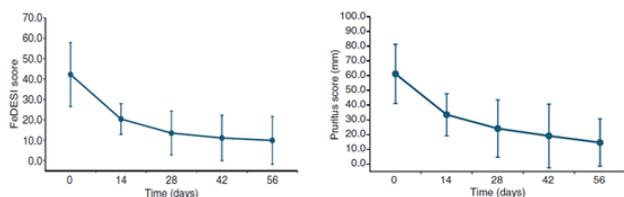
LESIONS



HYDROCORTISONE ACEPONATE CORTAVANCE (SCHMIDT ET AL, 2011)

lesions

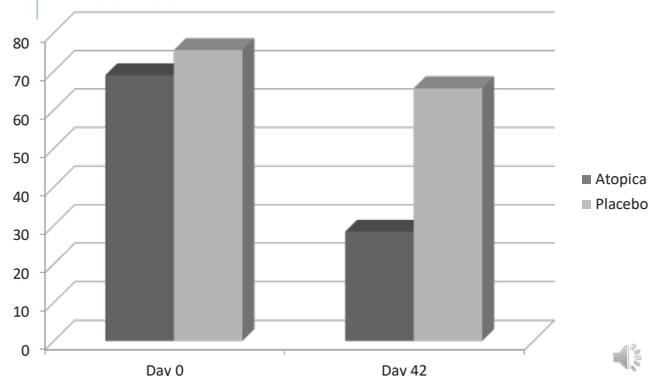
pruritus



No systemic immune suppression
 BUT: non-controlled study on only 10 cats... Placebo effect for allergic cats is about 23%



PRURITUS



SPEED OF ONSET OF EFFICACY

- Reduction of pruritus in 2-3 weeks time
- Full efficacy after 30-60 days
- Concurrent use of steroids and ciclosporin in the first 14 days of therapy
- Withdrawal of steroids after 2 weeks time
- Quick relief of pruritus and long term therapy with limited side effects

SIDE EFFECTS

Veterinary Ophthalmology



Original Article

An association between systemic cyclosporine administration and development of acute bullous keratopathy in cats

Kenneth E. Pierce Jr., David A. Wilkie, Anne J. Gemensky-Metzler, Paul G. Curran, Wendy M. Townsend, Simon M. Petersen-Jones, Joshua T. Bartoe

First published: 16 February 2016 | <https://doi.org/10.1111/vop.12367> | Citations: 3

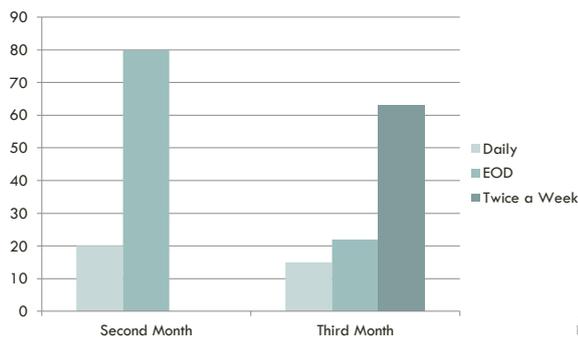


Veterinary Dermatology

Adverse events in 50 cats with allergic dermatitis receiving ciclosporin

Nicole A. Heinrich, Patrick J. McKeever, Melissa C. Eisenschenk

DOSE REDUCTION



WARNINGS

Ciclosporin does not appear to cause cistitis in cats

Do not use in case of:

- Age <6 months, weight <2,3 kg
- Liver or kidney disease
- Malignancies
- FIV+, FeLV+

Veterinary Dermatology

Scientific Paper

Investigation of subclinical bacteriuria in cats with dermatological disease receiving long-term glucocorticoids and/or ciclosporin

Samantha L. Lockwood, Anthea E. Schick, Thomas P. Lewis, Heide Newton

CICLOSPORIN ABSORPTION

Microemulsified ciclosporin absorption is very variable among cats, average 25%

JOURNAL OF Veterinary Pharmacology and Therapeutics

Disposition of cyclosporine after intravenous and multi-dose oral administration in cats

M. L. Mehl, A. E. Kyles, A. L. Craigmill, S. Epstein, C. R. Gregory

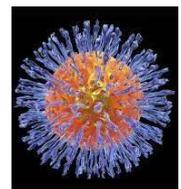
First published: 20 October 2003 | <https://doi.org/10.1046/j.1365-2685.2003.00496.x> | Cited by: 21

This paper was presented at the 11th Annual American College of Veterinary Surgeons Veterinary Symposium, Chicago, IL, USA, October 11-14, 2001.

□ Margo L. Mehl, Veterinary Medical Teaching Hospital, College of Agriculture and Environmental Sciences, University of California, Davis, CA, USA. E-mail: mmehl@ucdavis.edu

CICLOSPORIN AND HERPES

Cats experimentally inoculated with FHV-1 were administered CsA PO. Mild and self-limited clinical signs of activated FHV-1 occurred in some cats



Effect of ciclosporin and methylprednisolone acetate on cats previously infected with feline herpesvirus 1

Michael R. Lappin¹, Linda M. Roycroft²

CICLOSPORIN AND TOXOPLASMOSIS

Effect of oral administration of cyclosporine on *Toxoplasma gondii* infection status of cats A case of fatal systemic toxoplasmosis in a cat being treated with cyclosporin A for feline atopy

Mic Robert D Last¹, Yasuhiro Suzuki, Thomas Manning, David Lindsay, Laura Galipeau, Trevor J Whitbread
Stejza, 2018

No problem if ciclosporin is given after cats have acquired the infection

- No shedding of oocysts, no relapse of clinical signs



INJECTABLE CICLOSPORIN



In case of difficulty with the oral administration...

- Problems of restraint
- Excessive drooling

...human injectable product strictly SC

- 2,5-5mg/kg every 24-48h

Sandimmune

Veterinary Dermatology

50mg/ml

Scientific Paper

Subcutaneous administration of ciclosporin in 11 allergic cats – a pilot open-label uncontrolled clinical trial

Sandra N. Koch, Sheila M. F. Torres, Sandra Diaz, Sophie Gilbert, Aaron Rendahl

21



ANTI-HISTAMINES



Little evidence on the efficacy of antihistamines in feline allergic dermatitis

Old (1990-1999) uncontrolled studies

- Miller et al. 1990 – chlorpheniramine – 77%
- Miller et al. 1994 – clemastine – 50%
- Scott et al. 1998 – cyproheptadine – 45%
- Scott et al. 1999 – oxatamide – 50%
- Ravens et al. 2014 – loratidine – 21%



CETIRIZINE IN CATS

Papich et al, 2008: well absorbed orally and able to maintain high plasma concentrations for 24h

Griffin JS et al 2012 open study 5mg/cat/day:

- “repeatable and sustainable reduction in pruritus in 41% (13/32) of allergic cats”
- “In all 13 cats that improved while receiving cetirizine, improvement was lost when the cetirizine was stopped and regained after readministration”
- 75% of cats improved <25%
- 9% improved >50%



HOW TO SUCCESSFULLY TREAT ALLERGIC CATS PART 2

Dr. Chiara Noli

DVM, Dip ECVD

Servizi Dermatologici Veterinari

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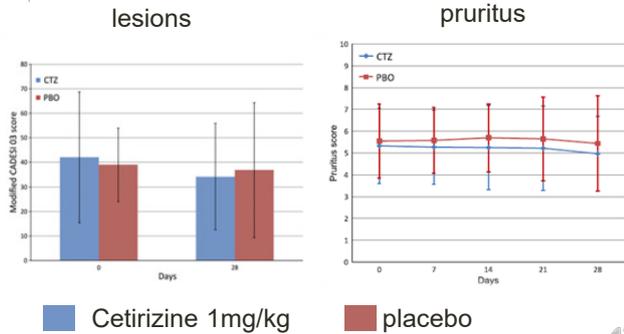
CETIRIZINE IN CATS

Wildermuth et al, 2013:

- First randomized, double-blind, placebo-controlled, crossover trial on antihistamines in cats
- 21 cats, 1mg/kg/day for 28 days or placebo
- 14 days washout period, then cross over
- Pruritus VAS and CADESI-03
- 10% of cats improved >50% with cetirizine
- 20% of cats improved >50% with placebo
- No statistical difference between cetirizine or placebo in pruritus or lesions



CETIRIZINE – WILDERMUTH ET AL, 2013



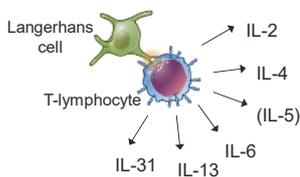
OCLACITINIB IN CATS

Pilot trial in 12 “atopic” cats (Ortalda et al, 2015)
 • 0.4-0,6mg/kg bid for 2 weeks, then daily for 2 weeks
 • Lesions and pruritus improved in 6/12 cats (50%)



OCLACITINIB (APOQUEL®)

Janus-kinase inhibitor, blocks pruritogenic pro-inflammatory and pro-allergic cytokine function
 Inhibits pruritus induced by the pruritogenic cytokine IL-31



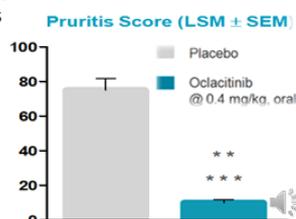
OCLACITINIB IN CATS

Non-controlled study in 15 cats with “head and neck pruritus” (Pandolfi et al, WCVD8, 2016)
 • Non-responsive to steroids (11 cats) or to ciclosporine (4 cats)
 • 0,5-0,8mg/kg bid for 2 weeks, then daily for 2 weeks
 • Lesions and pruritus 10/15 cats (66%)



IL-31 AND OCLACITINIB IN CATS

Feline IL-31 has been identified
 It has an activity similar to canine IL-31
 Oral oclacitinib at 0.4 mg/kg is able to reduce IL-31-induced pruritus in cats



Veterinary Dermatology

A pharmacokinetic study of oclacitinib maleate in six cats

Lluís Ferrer, Isaac Carrasco, Carles Cristófol, Anna Puigdemont

Rapidly absorbed if given orally

BUT: rapid elimination!

- Half-life 2,3 hours
- Larger doses and shorter dosing intervals are recommended

→ Probably ideal dose is 1mg/kg BID in the cat

Veterinary Dermatology

A double-blinded, randomized, methylprednisolone-controlled study on the efficacy of oclacitinib in the management of pruritus in cats with nonflea nonfood-induced hypersensitivity dermatitis

Chiara Noli, Irina Matricoti, Carlo Schievano

Cats with:

- non seasonal pruritus,
- non responsive to an 8-week long hypoallergenic diet
- non responsive to flea and ectoparasite control
- treated for 28 days with oclacitinib ~1mg/kg bid or with methylprednisolone ~1mg/kg bid for 4 weeks



RESULTS BLOOD TEST

* 14/22 blood test abnormalities

Alteration	Oclacitinib	Methylpred.
Mild leucopenia	0% (0/11)	12.5% (1/8)
Mild lymphopenia	0% (0/11)	14.2% (1/7)
Mild neutropenia	9.1% (1/11)	14.2% (1/7)
Mild thrombocytopenia	9.1% (1/11)	12.5% (1/8)
Mild elevated urea	50% (6/12)	0 (0/10)
Mild elevated creatinin	25% (3/12)	0 (0/10)
Increased glycemia	0% (0/12)	20% (2/10)*
Increased ALT	8.3% (1/12)	40% (4/10)**

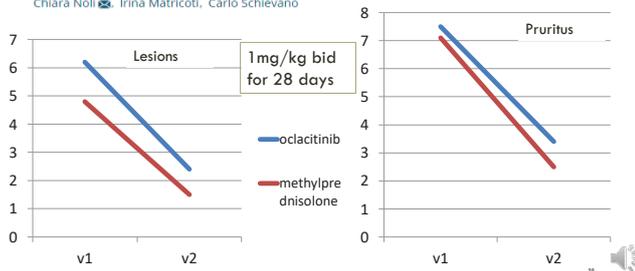
*one of which high increase; ** two of which high increase

Veterinary Dermatology

Scientific Paper

A double-blinded, randomized, methylprednisolone-controlled study on the efficacy of oclacitinib in the management of pruritus in cats with nonflea nonfood-induced hypersensitivity dermatitis

Chiara Noli, Irina Matricoti, Carlo Schievano



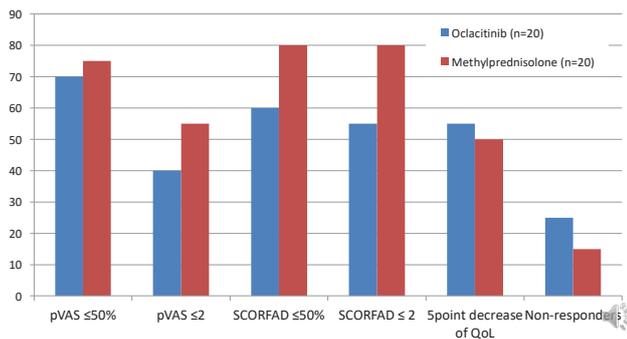
A blinded, randomized, placebo-controlled trial of the safety of oclacitinib in cats



Natália Lôres Lopes^{1*}, Diefrey Ribeiro Campos², Marilla Alves Machado², Mariana Silva Revoredo Alves², Manuela Silva Gomes de Souza³, Cristiano Chaves Pessoa da Veiga⁴, Alexandre Merlo⁵, Fábio Barbour Scott⁶ and Julio Israel Fernandes⁷

- 30 healthy cats treated for 28 days
- Placebo or oclacitinib 1 mg/kg or 2mg/kg BID
- Haematology within reference range
- Mild decrease of eosinophils, within range
- Renal and hepatic enzymes within range
- Mild increase fructosamine, within range
- Urine within reference range

OCLACITINIB 1MG/KG BID FOR 28 DAYS PERCENTAGE OF CATS THAT OBTAINED...



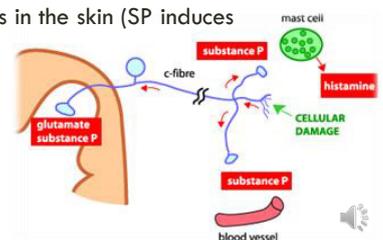
MAROPITANT



Neurokinin receptor (NK1R) antagonist

Inhibits binding of substance P to NK1R

- antiemetic and analgesic properties in the CNS
- antipruritic properties in the skin (SP induces degranulation of mast cells and eosinophils)
- inhibition of itch transmission in the spinal cord nerves



MAROPITANT (CERENIA)

- Anecdotal at 2mg/kg as antipruritic drug in cats
- A human analogue of maropitant, aprepitant, has been reported to be effective in refractory pruritus in humans (Huh et al, 2016).
- Interesting in: cases where immunosuppression is not desirable (FIV+, FeLV+) and diabetic cats
- Very expensive!!!! → Have the large 160mg dog tablet reformulated by the pharmacist



> J Feline Med Surg. 2019 Oct;21(10):967-972. doi: 10.1177/1098612X18811372. Epub 2018 Nov 14.

Use of maropitant for the control of pruritus in non-flea, non-food-induced feline hypersensitivity dermatitis: an open-label, uncontrolled pilot study

Elisa Maina^{1,2}, Jacques Fontaine³

MAROPITANT

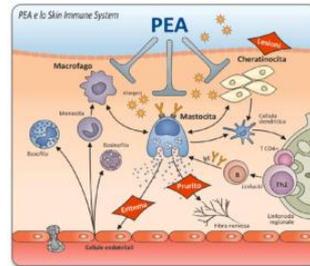
Maina and Fontaine

- 12 cats with "atopic dermatitis"
- 2mg/kg/day for 4 weeks
- pruritus**
- 91,7% of cats had a decrease of pruritus > 2.
- Scores pre 7,79 (±1,72) → post 2,15 (± 2,14).
- lesions**
- 75% of cats improved by >50%
- Scores pre 7,08 (±2,27) → post 2,25 (± 1,42)
- One cat was a treatment failure (8,3%)

PALMITOYLETHANOLAMIDE (PEA)

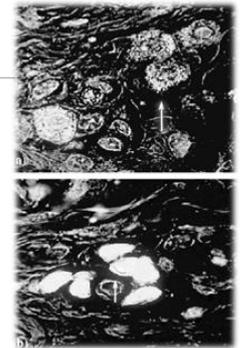
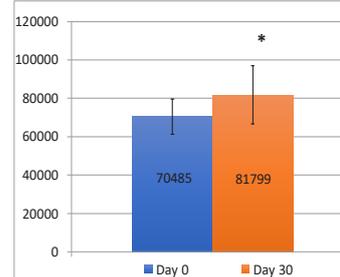


- Bioactive lipid physiologically produced by cells when exposed to damage (endocannabinoid pathway)



- Inhibits degranulation of mast cells and inflammation
- Decreases pruritus
- Safe and «natural»
- Indication also for cats

MASTCELL DENSITOMETRY



Scarpella et al, Veterinary Dermatology, 2001

HOW TO SUCCESSFULLY TREAT ALLERGIC CATS PART 3

Dr. Chiara Noli

DVM, Dip ECVD
Servizi Dermatologici Veterinari
Peveragno



PEA FELINE DERMATOLOGY

Clinical and histological evaluation of an analogue of palmitoylethanolamide, PLR 120 (comiconized Palmidrol INN) in cats with eosinophilic granuloma and eosinophilic plaque: a pilot study

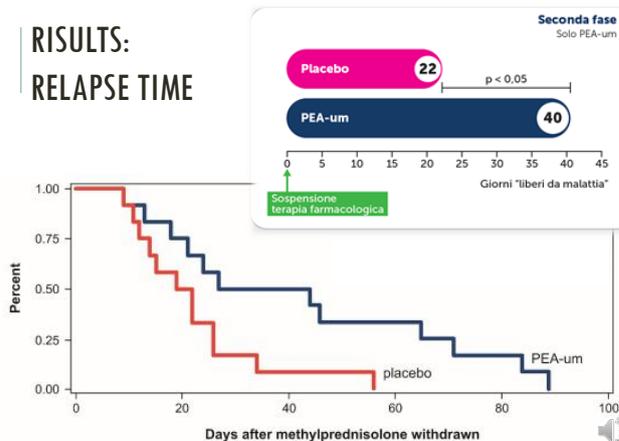
FABIA SCARAPPELLA,* FRANCESCA ABRAMO† and CHIARA NOLI*

Riduce segni e lesioni del CGE - Complesso del Granuloma Eosinofilo® (gatto - studio clinico)





RESULTS: RELAPSE TIME



PEA IN FELINE ALLERGIC DISEASE PROACTIVE THERAPY

- 57 cats with non-flea allergic pruritus
- Multicentric, randomized, placebo-controlled study
- Easy administration directly in the mouth or spread on the forelegs, excellent safety



Scientific Paper | Open Access | © | ⓘ

Effect of dietary supplementation with ultramicronized palmitoylethanolamide in maintaining remission in cats with nonflea hypersensitivity dermatitis: a double-blind, multicentre, randomized, placebo-controlled study

Chiara Noli, Maria Federica della Valle, Aida Miolo, Cristina Medori, Carlo Schievano, The Skinalla

Pruritus

After steroid withdrawal

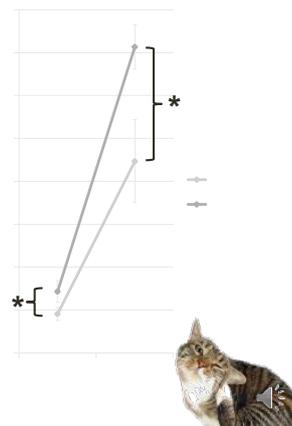
D28

Mean pVAS in PEA-um group significantly lower than placebo $p=0.03$

From D28 to final visit

Worsening in PEAum group significantly less severe than placebo group $p=0.04$

→ Steroid sparing effects!



STUDY OBJECTIVE

To evaluate the efficacy of

- oral ultra-micronised palmitoylethanolamide (PEA-um) at 15mg/kg/q24h
- for the maintenance of the clinical improvements
- obtained with the administration of methylprednisolone
- in cats with non-seasonal allergic dermatitis



ESSENTIAL FATTY ACIDS IN CATS

Fatty acids (number of cats evaluated)	Dose	Responses*			References Type of study
		Good-excellent-marked	Partial-moderate-fair	Poor-mild	
Evening primrose oil (n = 7)	0.5 mL/cat once daily		2/7	5/7	Logas and Kunkle 1993 ⁵¹ RCT
Evening primrose oil/fish oil (n = 14)	0.5 mL/cat once daily	11/14			Harvey 1993 ⁵³ Open study
Evening primrose oil (n = 6)	0.25 mL/cat once daily for 12 weeks	Mean overall clinical scores decreased from 7 to 2.2, self trauma scores from 50 to 12 and crusted papule score from 8 to 2			Harvey 1993 ⁵⁴ RCT
DVM Derr Cap Liquid (n = 10)	0.2 mL/kg once daily for 14-44 days	5/10		5/10	Miller and Scott 1993 ⁵² Case series
Mean outcomes		52%	6%	42% [‡]	

Veterinary Dermatology

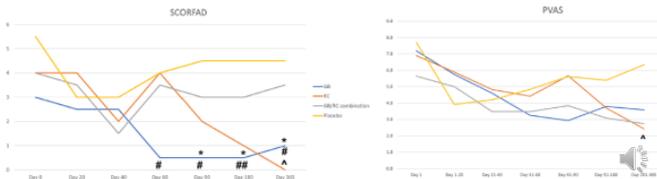
Intradermal immunotherapy with actinomycetales preparations as treatment for feline atopic syndrome: a randomized, placebo-controlled, double-blinded study

Domenico Santoro, Linda Archer and Lana Fagman

Heat-killed actinomycetales

- *Gordonia bronchialis* and/or *Rodococcus coprophilus*

5 intradermal injections D0, 20, 40, 90 and 180



REFRACTORY FELINE PRURITUS

Idiopathic feline ulcerative dermatitis:

“feline neck lesion”

- Severe self induced lesions due to scratching
- No response to antiallergic and antiparasitic drugs
- Possibly of neuropathic origin



GABAPENTIN

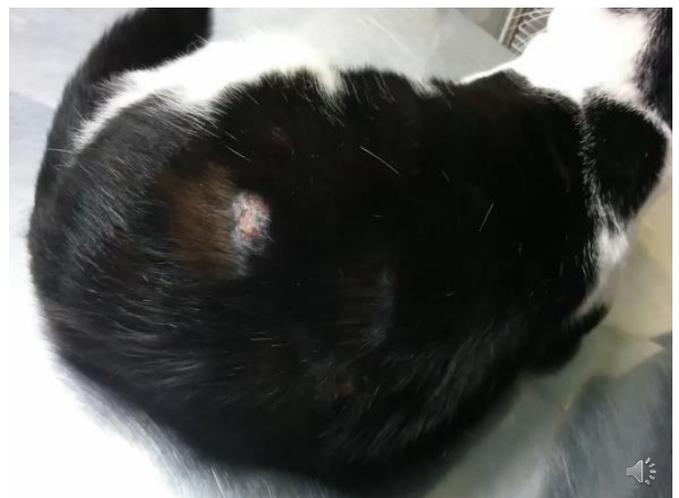
Anticonvulsive, pain modulator

Used in human uremic and neuropathic itch

↓ release of excitatory neurotransmitters

Anecdotal reports on its use in cats with pruritus or idiopathic ulcerative lesions and/or hyperaesthetic syndrome

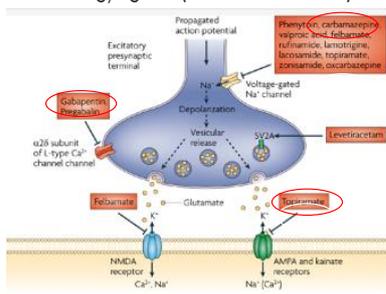
10mg/kg every 12h → 24h



REFRACTORY PRURITUS

gabapentin 10mg/kg bid (anecdotal)

topiramate 5mg/kg bid (Grant et al. 2014)



TOPIRAMATE (GRANT ET AL, 2014)

Antiepileptic for refractory epilepsy in cats

Antinociceptive and neuroprotective

Good results within one month at 5mg/kg every 12h

Relapses upon drug withdrawal (2 times)

Over 30 months in therapy with normal blood analyses



Grant et al, Veterinary Dermatology, 2014

LET US GET OUT OF COMMON PARADIGMS



It is not always a dermatological problem!

- 13 cats with self inflicted trauma on head and neck
- Evaluation of their animal welfare at home: low
- Interventions to improve animal welfare: environment, relationship with humans, etc
- Lesions healed within 15 days

Front Vet Sci. 2018 Apr 16;5:81. doi: 10.3389/fvets.2018.00081. eCollection 2018.

From Feline Idiopathic Ulcerative Dermatitis to Feline Behavioral Ulcerative Dermatitis: Grooming Repetitive Behaviors Indicators of Poor Welfare in Cats.

Tieux E¹, Gilbert C^{1,2}, Briand A^{3,4}, Cochet-Faivre N^{3,4,5}.



Randomized Controlled Trial > Vet Dermatol. 2012 Apr;23(2):110-8, e24-5.
doi: 10.1111/j.1365-3164.2011.01020.x. Epub 2011 Dec 1.

Response of feline eosinophilic plaques and lip ulcers to amoxicillin trihydrate-clavulanate potassium therapy: a randomized, double-blind placebo-controlled prospective study

Brett E Wildermuth¹, Craig E Griffin, Wayne S Rosenkrantz



WHAT ELSE CAN WE DO?



FIRST LINE ANTIBIOTICS

Clindamycin, cephalexin, cefadroxil, amoxicillin/
clavulanic acid, TMP-sulfonamides

Cefovecin: first choice only if there are severe compliance and/or administration problems

New FVE-EMA guidelines: **prudence** – **caution** - **restrict**



PYODERMA IN CATS

S. pseudintermedius or *S. aureus*: normal residents of the skin in cats

Pasteurella multocida oral contamination

Often infection of self-induced lesions

- Pruritus on head and neck → excoriations
- Eosinophilic plaques, ulcerated granulomas



SECOND LINE ANTIBIOTICS

Marbofloxacin, pradofloxacin

Tylosin, azithromycin, clarithromycin

Doxycycline, minocycline

ANTIBIOTICS NOT TO BE USED

Non-potentiated penicillins (ampicillin, amoxicillin without clavulanic acid) – ARE NOT EFFECTIVE

Imipenem, vancomycin, linezolid – RESERVED FOR HUMAN USE



TREATMENT DURATION



Treat until clinical healing

- Resolution of lesions, negative cytology

Minimum of 2 weeks, may be even much longer

Controls every 7-14 days

- If no improvement or new lesions: repeat bacterial culture and susceptibility test

Avoid self inflicted trauma, which inhibits lesions healing



THANK YOU FOR YOUR ATTENTION!



PHYSICAL PROTECTION



NAIL CAPS

Veterinary Dermatology

Letter to the Editor

Nail caps: a practical solution for pruritic cats

Elisa Maina, Lisa Graziano, Luisa Corneglani



AUTOIMMUNE DISEASES



Dermatosis auto inmunes y inmunomediadas en gatos: lo poco que sabemos

Dr. Chiara Noli, Díp ECVD
Servizi Dermavet, Peveragno, Italia



Desmosome autoimmunity

Autoimmune diseases

Desmosome autoimmunity:

- pemphigus foliaceus, vulgaris, paraneoplastic

Basement membrane autoimmunity:

- Mucous membrane pemphigoid
- Bullous pemphigoid

Keratinocyte injury:

- Lupus

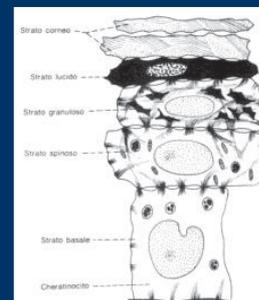
Melanocytes:

- Vitiligo



Patogenesis del pénfigo

- producción de auto-anticuerpos contra los **desmosomas**, las estructuras de adhesión de los queratinocitos
- desprendimiento singular de queratinocitos → **acantolisis**



Autoimmune diseases

Desmosome autoimmunity:

- pemphigus foliaceus, vulgaris, paraneoplastic

Basement membrane autoimmunity:

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Keratinocyte injury:

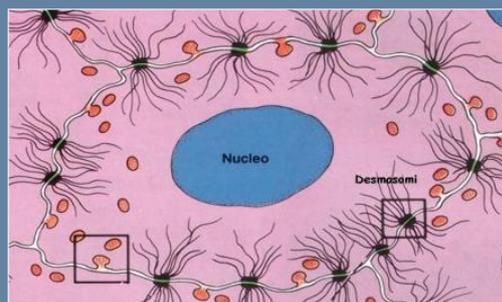
- Lupus

Melanocytes:

- Vitiligo



Desmosoma



Desmosoma

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Objetivo (diana) del anticuerpo durante el curso del pénfigo foliáceo y pénfigo vulgar

Queratinocito

Queratina

Placa

Caderina (desmogleina 1,2,3, desmocollina 1,3)

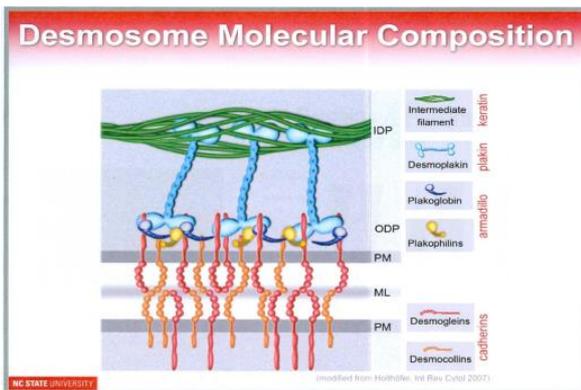
Queratina

Queratinocito

Desmocollina 1
Desmogleina 3

Pénfigo foliáceo

Pénfigo vulgar

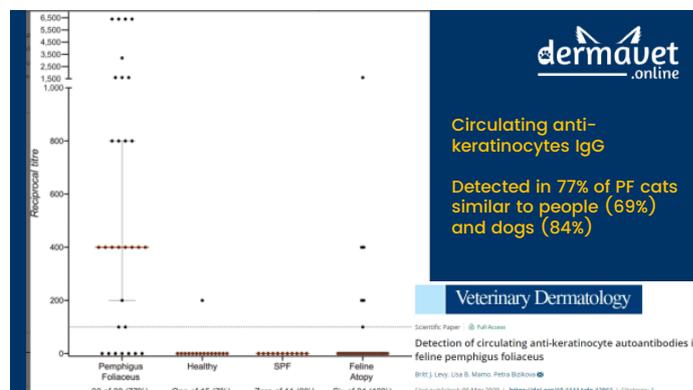


Pemfigo foliaceo

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Desmocollina 1
Desmogleina 3
también en
cavidad oral

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Pemphigus foliaceus in cats

- The most frequent **autoimmune** skin disease:
 - **186 cases** reported in several articles
- **1%** of all skin disease
- Tissue bound and circulating anti-keratinocyte IgG have been detected
- The target of auto-antibodies has not yet been determined

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Feline PF

- **Breeds** resported: DSH, Siamese, Persian, Burmese, Hymalaian
- **Age:** median 6 years, range 4 months-16years
- Female:male 1,4:1
- Usually spontaneous
 - Some drug induced
 - Some thymoma associated



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Positive green fluorescence (IgG deposition) at the cell borders in the stratum spinosum

Positive buccal mucosa ≠ dogs

Veterinary Dermatology

Scientific Paper: Full Access
 Detection of circulating anti-keratinocyte autoantibodies in feline pemphigus foliaceus
 BRJ | Levy, Lisa S, Mamo, Petra Bickova
 First published: 06 May 2020 | <https://doi.org/10.1111/advd.12861> | Citations: 1

Lesions: pustules

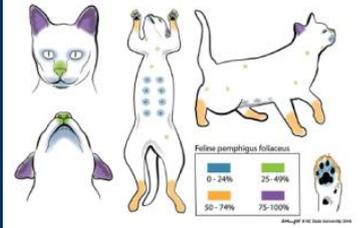
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Lesions: pustules




Pénfigo foliáceo

- pabellones 85%
- dorso de la nariz 85%
- en torno pezones 10%
- almohadillas 22%
- lechos ungueales 56%

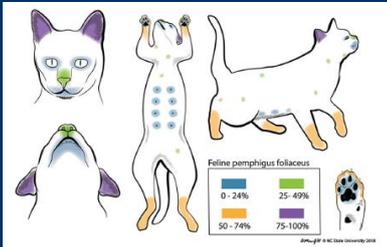


Lesions: crusts




Localisation of lesions

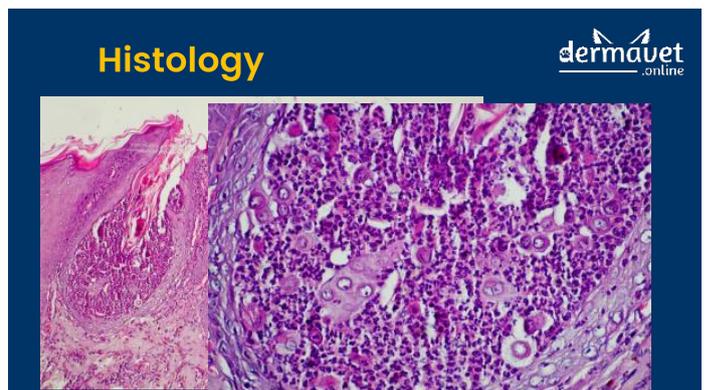
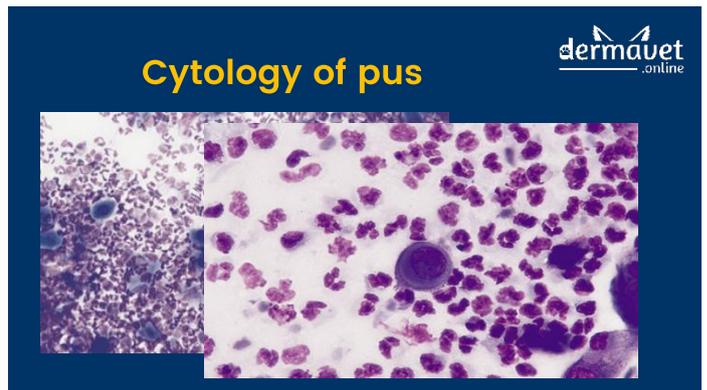
- Pinnæ 85%
- Nose bridge 85%
- Around nipples 10%
- Foot pads 22%
- Nail beds 56%

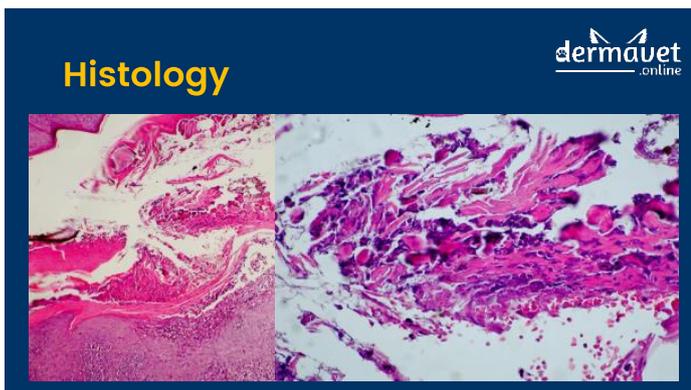
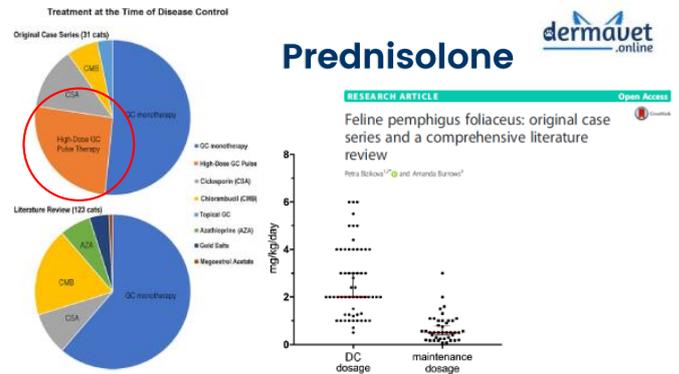
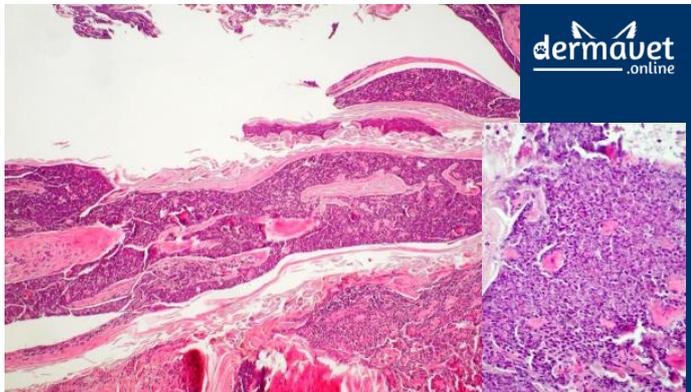


Lesions: erosions









Veterinary Dermatology

Pulse therapy

Scientific Paper Full Access

Oral glucocorticoid pulse therapy for induction of treatment of canine pemphigus foliaceus – a comparative study

Petra Bolkova, Thierry Olivry

- Quickly achieves disease control
- High steroids daily for 3 days
 - 10mg/kg prednisolone
 - 1mg/kg dexamethasone
 - 10mg/kg methylprednisolone
 - 1mg/kg triamcinolone
- Then standard maintenance dose
- Can be repeated if necessary 1 pulse/week

Treatment

- Remission in **93%** of cases in **3 weeks**
- Prednisolone 2–4mg/kg, triamcinolone 0,2–0,4 mg/kg, dexamethasone 0,1–0,2mg/kg
 - Then decrease dosis by 25% after 2 weeks of no new lesions and old lesions healed by 80%
- +/- **ciclosporin** 7mg/kg
- Chlorambucil 0,1–0,3mg/kg
- Tetracycline–niacinamide

Feline PF and ciclosporin

- Retrospective comparison between glucocorticoids +chlorambucil or glucocorticoids + ciclosporin:
 - No difference in remission time or disease response
 - Ciclosporine group could stop steroids, not chlorambucil group

Veterinary Dermatology

Full Access

Use of modified ciclosporin in the management of feline pemphigus foliaceus: a retrospective analysis

Katherine E. Irwin, Karin M. Beale, Valerie A. Fadok

Hydrocortisone aceponate



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Feline PV lesions

- Flaccid **vesicle** → erosion
 - Marginal Nikolsky sign
- Oral cavity, lips, nose, philtrum
 - Sialorrea, halitosis, dysphagia
- Haired skin
- Paw pads
- Systemic signs
 - Lethargy, enlarged lymphnodes



Nikolsky's Sign

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Pénfigo vulgar

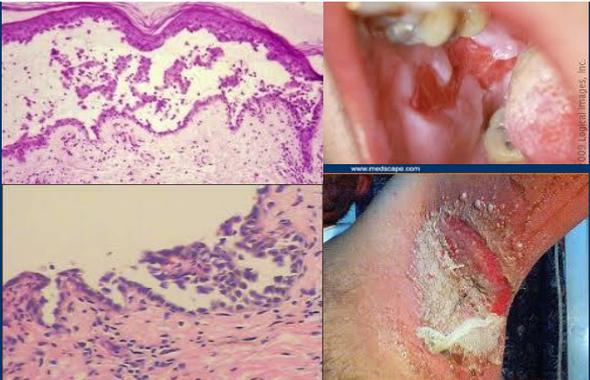
- Very rare disease
- Only **4 cases** described
 - 1 female, 3 males
 - Median age 5 years (1-14 years)
 - no known predisposition of breed, sex and age
- Target antigen not known in cats
 - Probably Dsg3 as in man and dogs

dermavet.online



From: Bizikova P: Autoimmunedisease. In Noli C and Colombo S. (eds) Feline Dermatology. Springer 2020

dermavet.online



www.medicape.com

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REVIEW Open Access

Deep pemphigus (pemphigus vulgaris, pemphigus vegetans and paraneoplastic pemphigus) in dogs, cats and horses: a comprehensive review

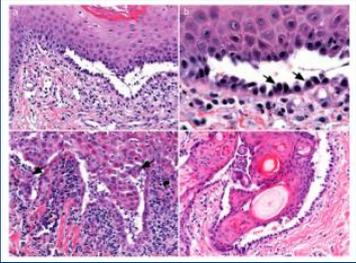
Hong L. Thiam¹, Sethi G. Linder² and Thany Oliby³

Histologia

REVIEW Open Access

Deep pemphigus (pemphigus vulgaris, pemphigus vegetans and paraneoplastic pemphigus) in dogs, cats and horses: a comprehensive review

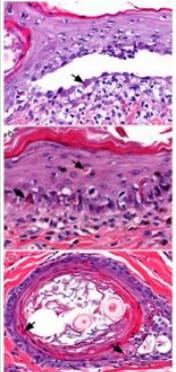
Hong L. Tham¹, Keith E. Under² and Thierry Olivry³



- acantolisis suprabasal y formación de vesículas
- desprendimiento del epitelio por encima de la capa basal

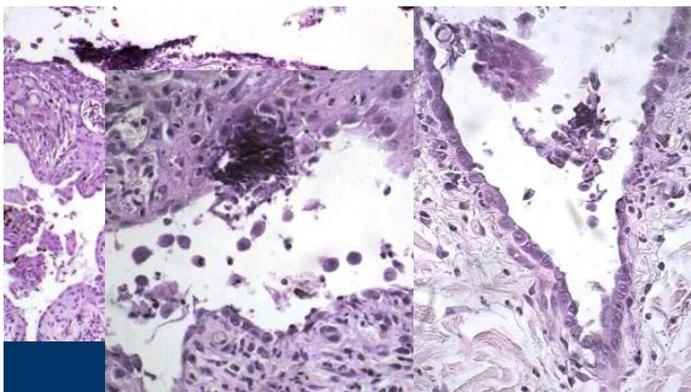
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Paraneoplastic pemphigus



- Signs of PV without oral lesions
- Histology with lesions of both PV and EM
- Antikeratinocyte IgGs in the skin and in blood
- Maybe antigen plakín

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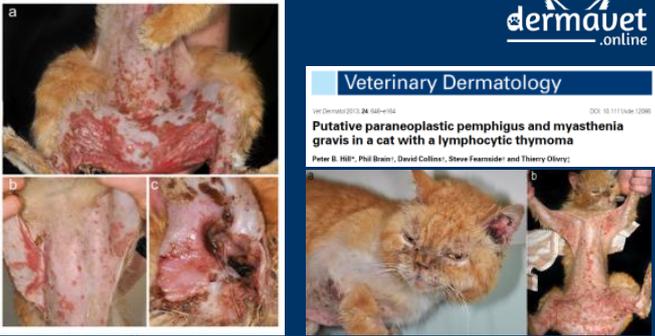
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Veterinary Dermatology

10/11/2021

Putative paraneoplastic pemphigus and myasthenia gravis in a cat with a lymphocytic thymoma

Peter B. Hill¹, Phil Brain², David Collins³, Steve Farnside⁴ and Thierry Olivry⁵



Therapy

- Glucocorticoids
- +/- other steroid-sparing drugs

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Pseudo pemphigus ?

- 8 male cats, 1 female, all in Northern California
- 30 miles radius, two littermates
- Crusty dermatitis with acantholytic cells
- **Unresponsive** to any treatment

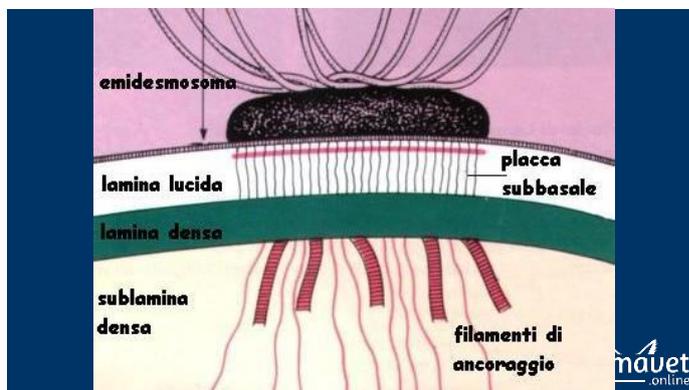
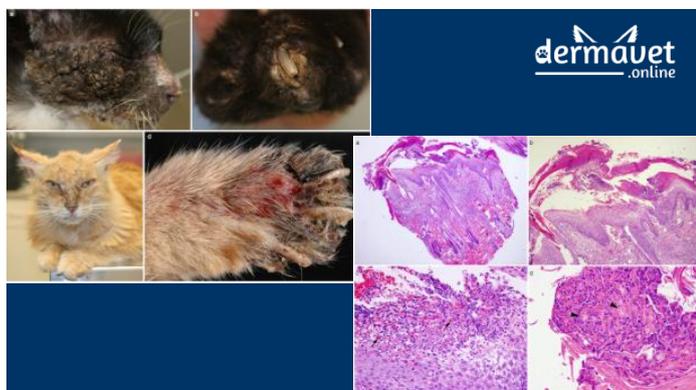
Veterinary Dermatology

10/11/2021

An unresponsive progressive pustular and crusting dermatitis with acantholysis in nine cats

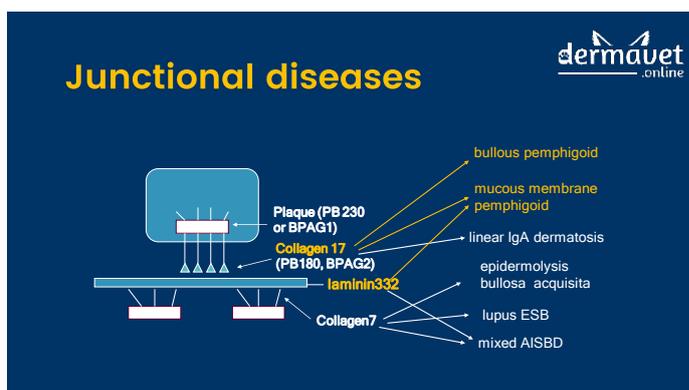
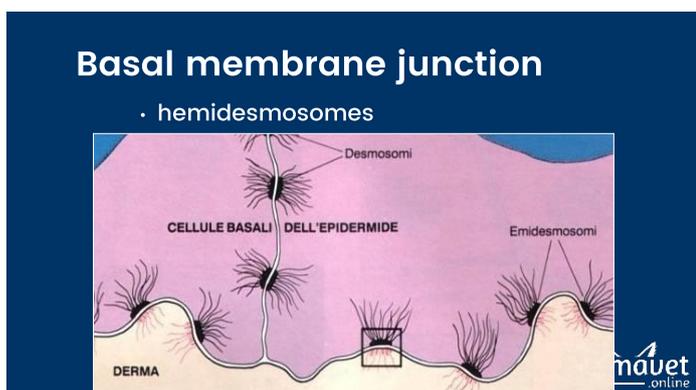
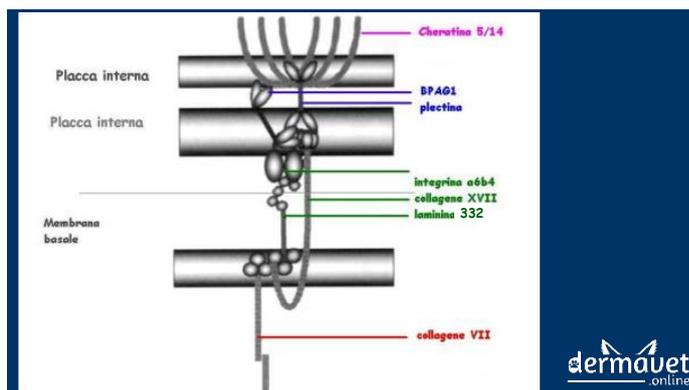
Catherine A. Outerbridge¹, Verena K. Affolter¹, Leslie A. Lyons¹, Samantha L. Crothers², Andrea T. H. Lam³, Terri E. Bonenberger⁴, Peter J. Burke⁵ and Stephen D. White⁶

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Basement membrane autoimmunity

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Mucous membrane pemphigoid

- Two cats described: antibodies against
 - Collagen XVII (one cat) and laminin 332 (one cat)
- Vesicles and erosions on mucosae and mucocutaneous junctions
 - Eyelids, lips, palate, concave pinnae

Laminin-5 is targeted by autoantibodies in feline mucous membrane (cicatrical) pemphigoid

Thierry Olivry^{a,*}, Stanley M. Dunston^a, Guyun Zhang^b, Reza F. Ghohestani^b



Feline MMP



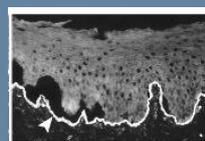
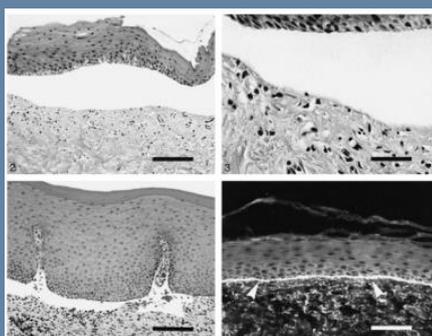
6 cats (4 DSH) F:M ratio: 1.0 1-8 years (med: 4)
2 cats with high elevation of ALT!

Bullous pemphigoid

- One cat described: antibodies against the NC16A domain of collagen XVII
- Vesicles and erosions
 - on ears, trunk and extremities, mild oral lesions

Novel Feline Autoimmune Blistering Disease Resembling Bullous Pemphigoid in Humans: IgG Autoantibodies Target the NC16A Ectodomain of Type XVII Collagen (BP180/BPAG2)

T. OLIVRY, L. S. CHAN, L. XU, P. CHACK, S. M. DUNSTON, M. FAHEY, AND M. P. MARINKOVICH



Salt-split skin: antibodies on the dermal side of the vesicle

After therapy



FELINE EXFOLIATIVE DERMATITIS



Immune-mediated diseases of the cat

Dr. Chiara Noli, DVM, Dip ECVD
Servizi Dermatologici Veterinari, Peveragno (CN)

Feline exfoliative dermatitis

- Clinical picture:
 - Diffuse **erythema**
 - Fine **exfoliation** → large scales
 - Head and pinnae → whole body
 - **Alopecia**, hair easily epilated
 - Possible secondary **Malassezia** infection
 - Initially no pruritus, present with infections



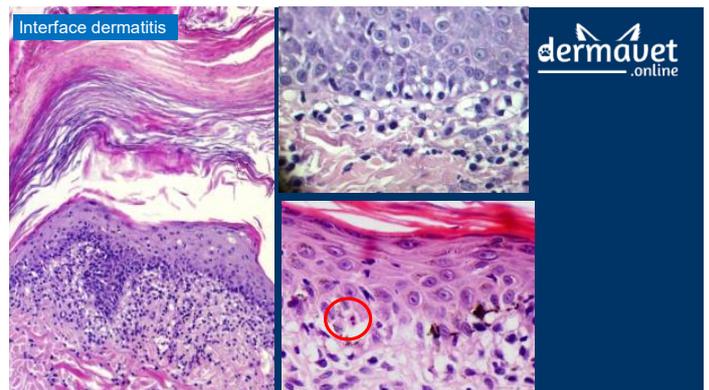
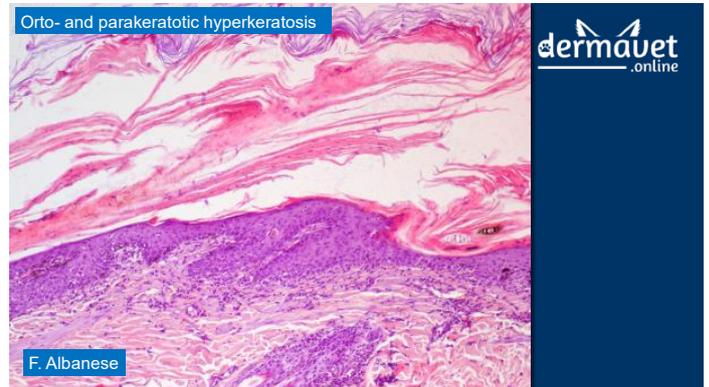
Feline exfoliative dermatitis



Feline exfoliative dermatitis

- Adult / old cats (4-13, av. 7.6 years)
- Usually associated with **thymoma** (benign)
 - Some idiopathic cases **without thymoma** described
- Possible concomitant presence of:
 - miastenia gravis
 - polimyositis
 - miocarditis





Feline exfoliative erythroderma

- Skin histology
 - severe orthokeratotic hyperkeratosis and hyperplasia of the epidermis
 - lymphocytic exocytosis, interface dermatitis with apoptosis
 - mixed cell infiltrate in the dermis
- very similar to an autoimmune disease !





Veterinary Dermatology

Ver Dermatol 2015; 26: 40-43 DOI: 10.1111/Adv.12169

Nonthymoma-associated exfoliative dermatitis in 18 cats

Monika Linek*, Silvia Rüfenacht†, Chiara Brachelente‡, Claudia von Tscharnert, Claude Favrot§, Sylvia Wilhelm†, Claudia Nett†, Ralf S. Mueller**, Ursula Mayer†† and Monika Welle‡

- 12/18 with systemic signs
- 4/12 non diagnostic systemic alterations
 - Lymphocytic hepatomegaly, splenomegaly
 - Generalised lymphadenopathy
 - Pancreatitis
- 12/18 successfully treated with immunosuppressive therapy ([methyl]prednisolone, ciclosporin, dexamethazone)
- 1/18 spontaneous remission

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EM – SJS/TEN complex

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Feline exfoliative dermatitis

- Pathogenesis unknown
 - autoimmune reaction against keratinocytes ?
 - sensibilisation towards the epithelial component of the thymus?
 - imbalance of the mechanisms of self-tolerance modulated by the thymus ?

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EM and SJS/TEN Complex

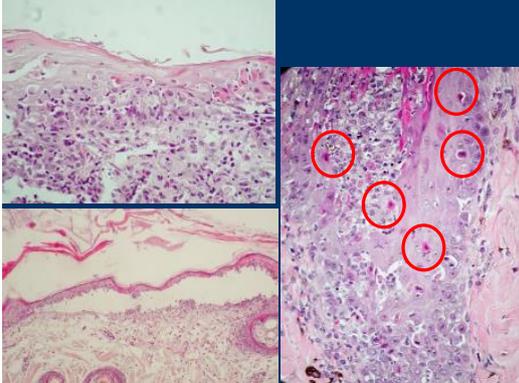
- Diseases characterized by single or massive death of keratinocytes
- Associated with (viral) infections (EM), tumours and drug reactions (SJS/TEN)
- Different clinical presentations, depending on the severity:
 - Erythema multiforme minor
 - Erythema multiforme major
 - Stevens Johnson Syndrome
 - Toxic epidermal necrolysis

severity

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Erythema multiforme

- **Minor**
 - circular, arciform macules and papules
 - Central exfoliation and erosion
 - No systemic signs
- **Major**
 - involvement of mucous membranes
 - depression, hyperthermia, anorexia


Apoptosis at all epidermal layers

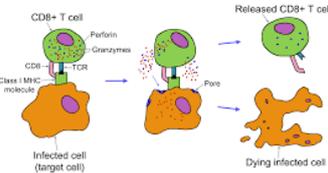
Epidermal detachment and erosions





Erythema multiforme

- Autoreactive T-cells generated and activated by an antigen-loaded epithelial cell (herpes ≅ man?)



Veterinary Dermatology

Free Access

P-34
A case of exfoliative erythema multiforme associated with herpes virus 1 infection in a European cat

C. Prost
First published: 16 August 2004 | https://doi.org/10.1111/j.1365-3164.2004.00414_34.x | Citations





Veterinary Dermatology

Vet. Dermatol. 2021; 32: 96-116 DOI: 10.1111/vidk.12901

Presumptive herpesvirus-associated erythema multiforme in a cat

Michela De Lucia*, Maria Cabré*, Daria Denti*, Giorgia Mezzu*, Tommaso Furlanello*

Three days after antiviral therapy with famciclovir 85mg/kg BID PO

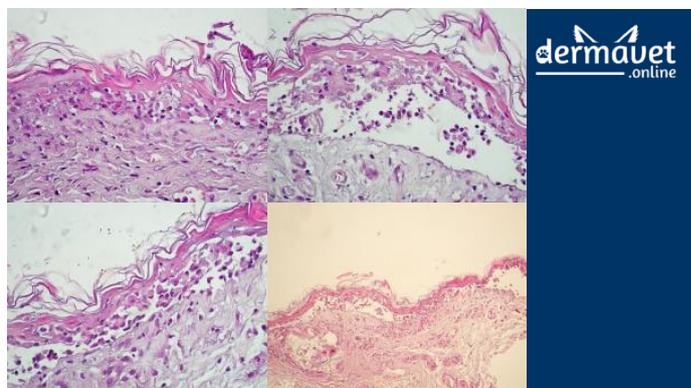



Stevens-Johnson Syndrome / Toxic epidermal necrosis

- Full thickness epidermal necrosis, on large body areas
 - 10% SJS – 30% TEN
- Positive Nikolski sign
- Severe systemic signs
 - Lethargy, anorexia, fever, etc.
 - Possible necrosis of respiratory and/or gastrointestinal epithelium
- More frequently drug-induced



Nikolsky's Sign



From F. Banovic – Immune mediated diseases. In: Noli C and Colombo S. Eds. Feline Dermatology, Springer, 2020

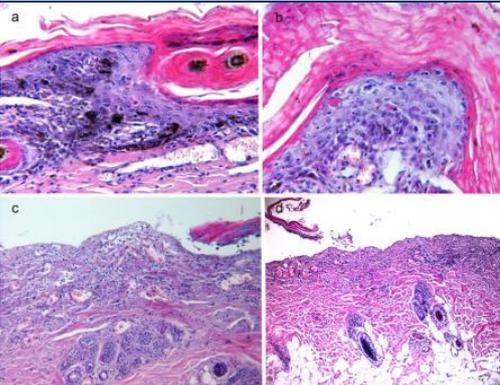
Journal of Feline Medicine and Surgery Open Reports

JFMS Open Rep. 2016 Jan-Jun; 2(1): 2055-11691663616. PMCID: PMC5362844
 Published online 2016 Jun 6. doi: 10.1177/205511691663616 PMID: 27691425

Stevens-Johnson syndrome/toxic epidermal necrolysis caused by cefadroxil in a cat
 Roberta Santus¹ and Silvia Colombo²



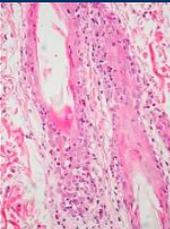

Mural lymphocytic folliculitis


From F. Banovic – Immune mediated diseases. In: Noli C and Colombo S. Eds. Feline Dermatology, Springer, 2020

Infiltrative lymphocytic mural folliculitis

- Observed in 33/47 skin diseases in 354 cats
 - 67% of cats with allergy
 - prevalence 10-100% depending on allergy
 - 33% of cats non-allergic disease
- Infundibulum >> isthmus
- Common non specific non diagnostic pattern



Feline Med Surg. 2010 Feb;12(2):80-5. doi: 10.1016/j.jfms.2009.05.015. Epub. 2009 Jun 24.

Infiltrative lymphocytic mural folliculitis: a histopathological reaction pattern in skin-biopsy specimens from cats with allergic skin disease
 Andrew S Rosenberg¹, Danny W Scott, Hollis N Erb, Sean P McDonough



Dermatosis	% with ILMF
Allergic dermatoses (n = 172)	
Allergic dermatitis*	66
Atopic dermatitis	36
Atopic dermatitis and flea allergy	100
Contact allergy	100
Eosinophilic granuloma*	100
Eosinophilic plaque*	79
Eosinophilic plaque†	33
Flea allergy	42
Food allergy	85
Indolent ulcer†	100
Mosquito allergy	50



Veterinary Dermatology 2001, 12, 279-283

Degenerative mucinotic mural folliculitis in cats

THELMA LEE GROSS*, THIERRY OLIVRY†, CARLO B. VITALE‡ and HELEN T. POWERS§

7 cats

Veterinary Dermatology 2000, 11, 75-80

Case report

A case of diet-related lymphocytic mural folliculitis in a cat

JAN DECLERCQ

Mural lymphocytic folliculitis with epidermal apoptosis and sebaceous adenitis

mural lymphocytic folliculitis with mucinosis

photo D. Heripret

photo Th. Olivry

Mural lymphocytic folliculitis

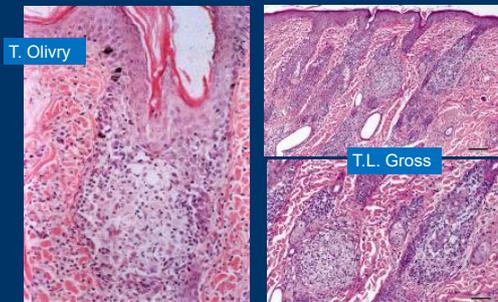
- Very rare disease
- Middle aged to old cats
- Clinical appearance
 - variable amount of **alopecia**
 - variable amount of **desquamation**, erythema and pruritus
- More severe form with **follicular mucinosis**

Inflammatory infiltrate in the isthmus and infundibulum

J. Yager

T.L. Gross

Piogranulomas in the isthmus and adjacent dermis, with multinucleated giant cells



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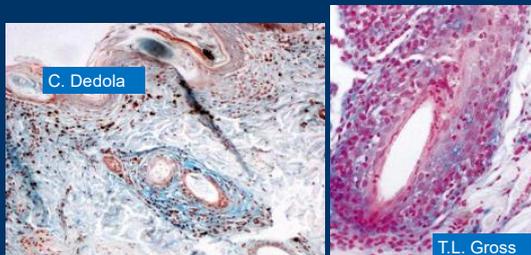
Mural lymphocytic folliculitis

- May be **idiopathic** or be the manifestation of an (often obscure) **underlying disease**
- **Therapy** for idiopathic cases
 - Steroids. Retinoids, cyclosporin
- **Prognosis**
 - depends on the etiology if not idiopathic
 - depends on the severity of the disease

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 .online

Mucinous mural folliculitis

Accumulation of mucin in the superficial external root sheath

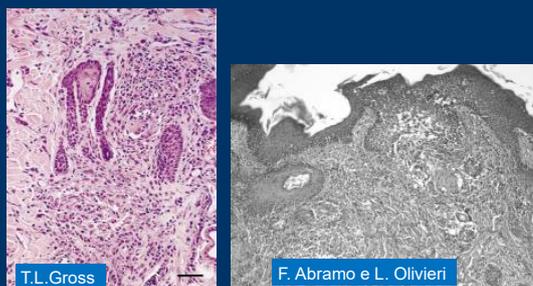


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C. Noli
 Therapy with ciclosporin with no results, died after a few days for unknown reason

- Alopecia due to destruction and/or follicular atrophy
- Sebaceous glands usually intact



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L. Olivieri
 Therapy with steroids and EFs for some months then euthanasia. FIV- and FeLV-, no signs of underlying disease

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Pseudopelade

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Pseudopelade

- Rare **alopecia**, only few cases described
- Diffuse alopecia with normal skin
- T-cell infiltrate in the **isthmus** region, follicle destruction
- **Ciclosporin** responsive

Veterinary Dermatology 2000, 11, 261-270

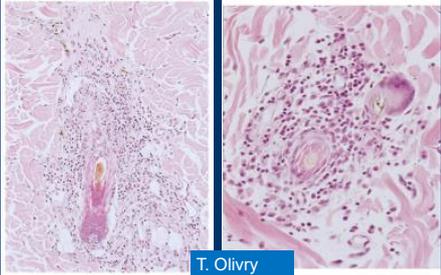
Anti-isthmus autoimmunity in a novel feline acquired alopecia resembling pseudopelade of humans*

THIERRY OLIVRY,† HELEN T. POWER,‡ JENNIFER C. WOO,§ PETER F. MOORE§ and DESMOND J. TOBIN*

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.online

Histology

- Isthmic infiltration by cytotoxic T-cells, in the dermis T-helper cells



T. Olivry

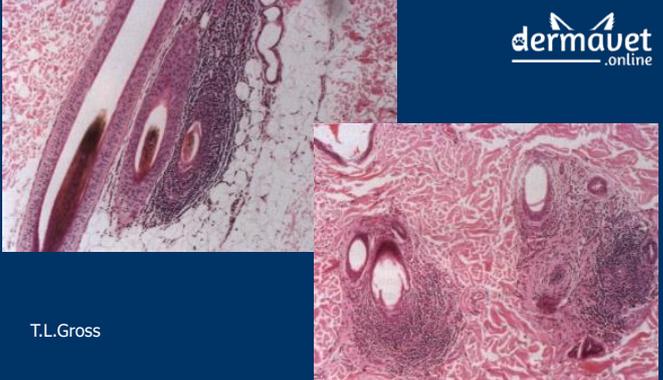
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T. Olivry

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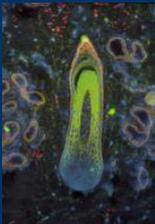
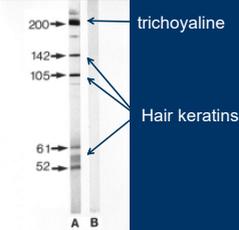
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T.L.Gross

Pathogenesis

- Perifollicular IgG deposition
- Circulating IgG against matrix, cortex and internal root sheath
- Possibly anti-trichoyaline or anti-keratine antibodies

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.online

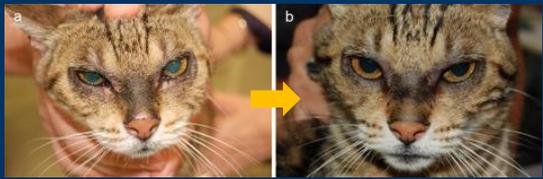
vet.online logo" data-bbox="808 163 921 196"/>

Sebaceous adenitis

vet.online logo" data-bbox="808 593 921 626"/>

Therapy

- Ciclosporin 7mg/kg/day



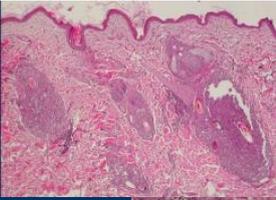
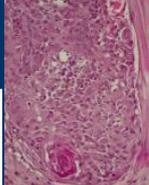
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.online

Sebaceous adenitis

- Inflammation centered on the **sebaceous** glands
- Infundibular accumulation of scales → follicular **plugs** (follicular casts)
- Decreased number of secondary hair, **hypotrichosis**



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Case report

Three cases of immune-mediated adnexal skin disease treated with cyclosporin

CHIARA NOLI and STEFANO TOMA

Veterinary Dermatology 2006, 17, 101-102



Dr. Luisa Cornegliani




Hypotrichosis

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Sebaceous adenitis

Treatment

- Ciclosporin 7mg/kg
- Topical fatty acids

Veterinary Dermatology 2006, 17, 85-92

Case report

Three cases of immune-mediated adnexal skin disease treated with cyclosporin

CHIARA NOLI and STEFANO TOMA

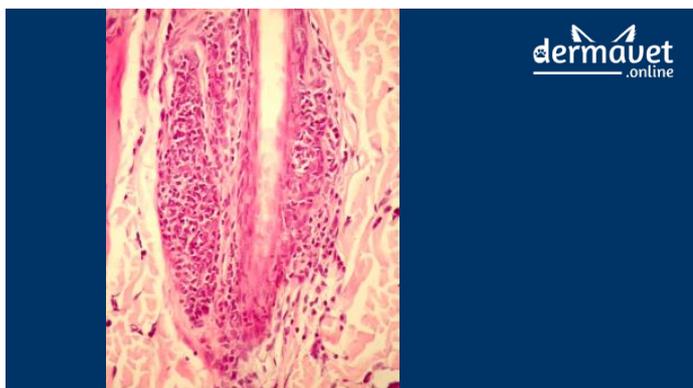
Veterinary Dermatology

Case Report

Sebaceous adenitis and mural folliculitis in a cat responsive to topical fatty acid supplementation

Katharina Glös, Wolf von Bomhard, Sonya Bettenay, Ralf S. Mueller

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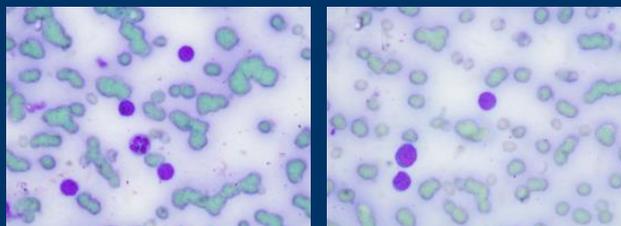




Plasmacellular pododermatitis



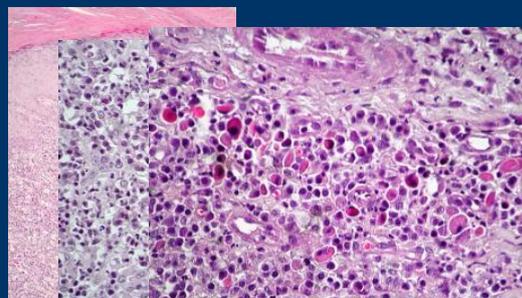
Plasmacellular pododermatitis



Plasmacellular pododermatitis



Plasmacellular pododermatitis



Type of infiltrate

- **Dias Pereira 2003** – 8 cases:
 - 8/8 perivascular plasmacellular
 - 4/8 leucocytoclastic vasculitis
- **Guaguère 2004** – 26 cases:
 - 2/26 superficial and deep perivascular lympho-plasmacellular
 - 15/26 diffuse pure plasmacellular
 - 4/26 diffuse plasmacellular with groups of lymphocytes in pseudo-follicular structures
 - 5/26 granulomatous



Associated findings

- **Hypergammaglobulinaemia** (Scarampella 2004, 100%)
- Possible glomerulonephritis or **amiloidosis**
- Trombocytopenia (Scarampella 2004, 70%)
- **Positivity to FIV:**
 - Guagueère 2004: 16/26
 - Scarampella 2004: 4/9
- Usually FeLV negative



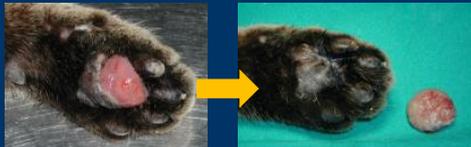
Plasmacellular nasal swelling

- **Declerq 2002**
 - Two cats with plasmacellular pododermatitis
 - Nodule on the nose with similar histology, conjunctivitis
- **Declerq 2010 e Besignor 2011**
 - Nodules on the nose with compatible histology but **without** plasmacellular pododermatitis
 - Rhinotracheitis and hypergammaglobulinaemia (Declerq)
 - Responsive to doxycyclin (Besignor)
- PCR for **calicivirus negative**



Therapy

- Prednisolone 1–4 mg/kg (Dias Pereira 2003)
- Surgery (Guaguere 2004, 24/26 cats)
- Doxycyclin 10mg/kg (Bettenay 2003)
- Ciclosporin 7mg/kg (anecdotal)
- Oclacitinib?

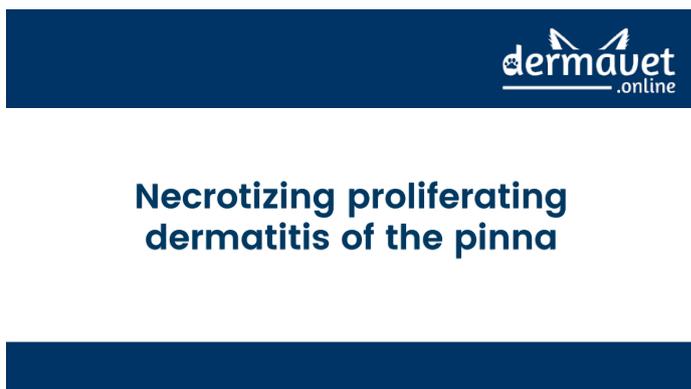
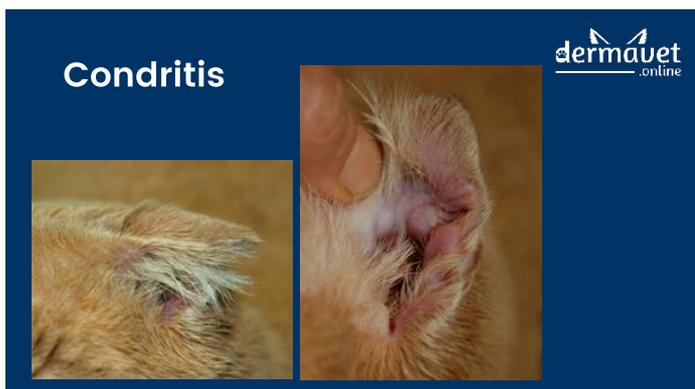


Pathogenesis and causes

- Chronic antigen stimulation, **infective???**
 - Response to doxycyclin (infective agents?)
- Presence of **antigens** in the footpads?
 - **FIV** positive PCR in the lesions (5/26, Guaguere 2004)
 - **FeLV** positive PCR (and FIV negative) (1 case Biezus 2020)
- PCR **negative** to all doxycyclin-sensitive pathogens (Bettenay 2007)
 - Bartonella, Ehrlichia, Anaplasma, Chlamidophila, Mycoplasma, Toxoplasma, Herpesvirus



Auricular chondritis

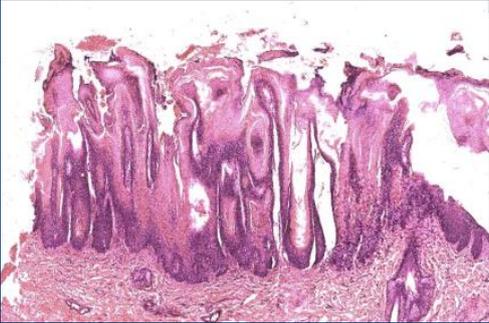


Otitis necrotizante proliferativa

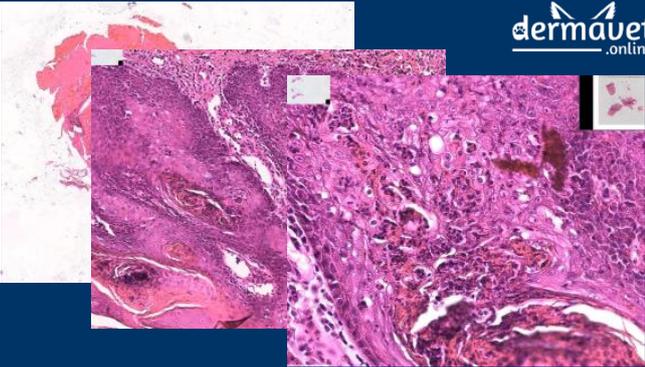


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Terapia tópică: tacrolimus



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GENETIC DISEASES OF CATS

GENETIC DISEASES OF CATS

Dr. Chiara Noli
 DVM, Dip ECVD
 Servizi Dermatologi Veterinari
 Peveragno (CN)



JUNCTIONAL EPIDERMOLYSIS BULLOSA

(Alhaidari et al, *Vet Dermatol* 2005)



GENETIC DISEASES

Epidermis

- Epidermolysis bullosa

Pigmentary defects

- Albinism, Waarderburg syndrome, lentigo

Dermis

- Cutaneous asthenia
- Lymphedema, angiomatosis

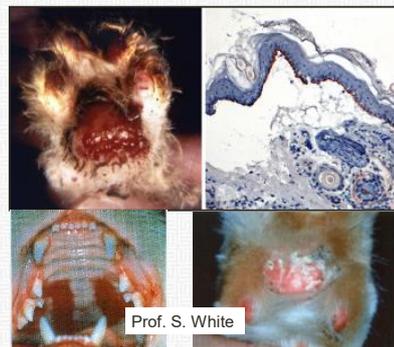
Hair

- Naked breeds and congenital alopecias
- Trichorexis nodosa and pili torti

Sebaceous glands dysplasia

EPIDERMOLYSIS BULLOSA DYSTROPHICA

(Olivry et al, *Vet Pathol* 1999)



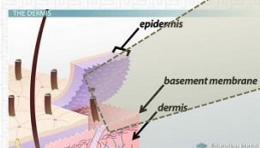
Prof. S. White

DISEASE OF THE EPIDERMIS

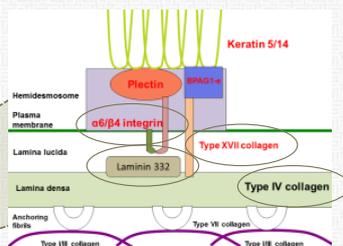
Epidermolysis bullosa

Junctional or dystrophic

Both described in cats



pinnal erosions, oral ulcerations, sloughing of foot pads and haired skin and nail detachment



CONGENITAL DEPIGMENTATION

Albinism

- lack of tyrosinase,
- white coat, blue eyes

Waardeburg-Klein syndrome

- defect in migration of melanocytes
- white coat, blue eyes and deafness



VITILIGO

Non inflammatory loss of pigmentation

In cats usually observed the Siamese breed



Dr. Colombo



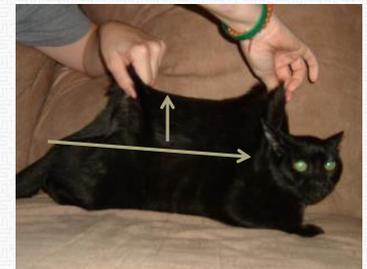
EXTENSIBILITY INDEX (EI)

$\frac{\text{Vertical height of skin fold} \times 100}{\text{Body length}} = \text{EI}$

Body length

In dogs > 14,5%

In cats > 19%



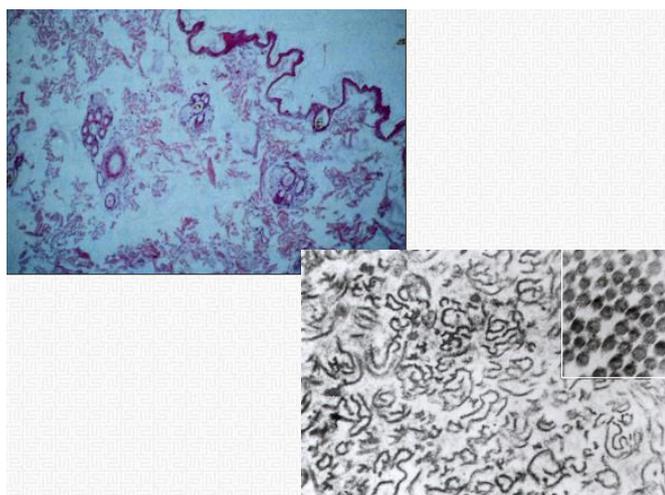
DISEASE OF THE DERMIS

Cutaneous asthenia

Ehlers-Danlos syndrome

Dermatosparaxis



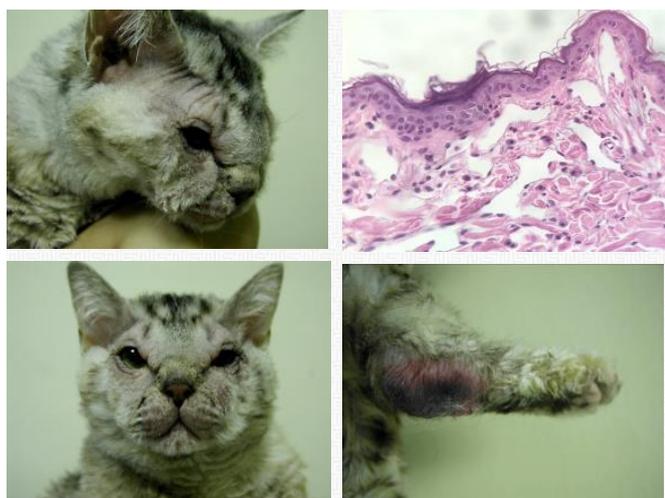


NAKED CAT BREEDS: SPHYNX AND DEVON REX

polymorphisms in Keratin 71 (KRT71) is responsible for curly/wavy phenotypes

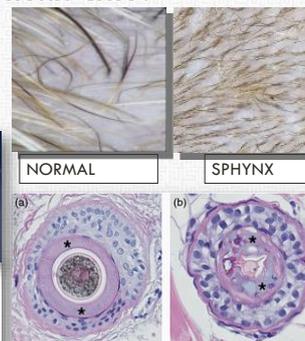
In Sphynx: hairless (hr) allele:
 • complete loss of function
 → naked cat

In Devon Rex: curly (re) allele:
 • partial loss of function
 → short curly hair



WHAT HAPPENS IN SPHYNX CATS?

Normal hair density
 Follicles are dysplastic and smaller



DISEASES OF THE HAIR

Determination of the coat type in cats

- KRT71
 - Hairlessness in Sphynx
 - Curly coat in Devon Rex
- LPAR6
 - curly coat in Cornish Rex and German Rex
- FGF5
 - long hair in many breeds



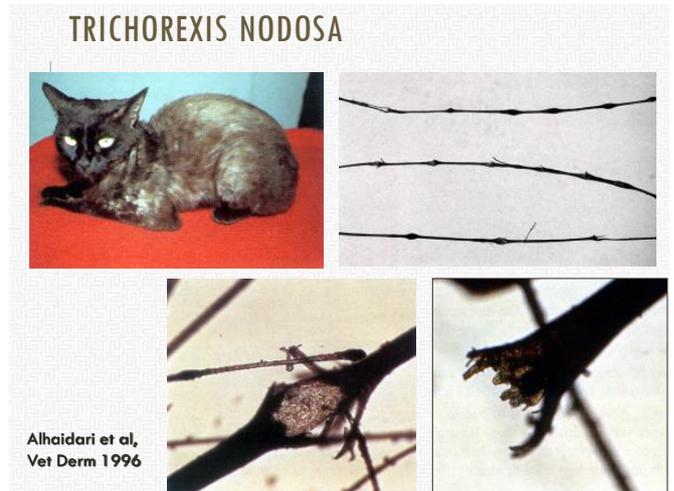
Wilkinson & Harvey

Congenital alopecia can occur in other breeds

An overview on congenital alopecia in domestic animals

Lars Meelenberg
 Herford, Germany
 Correspondence: Lars Meelenberg, DVM, PhD, Veterinary
 Medicine, University of Veterinary Medicine, 32300 Herford, Germany.
 Email: l.meelenberg@vfu.uni





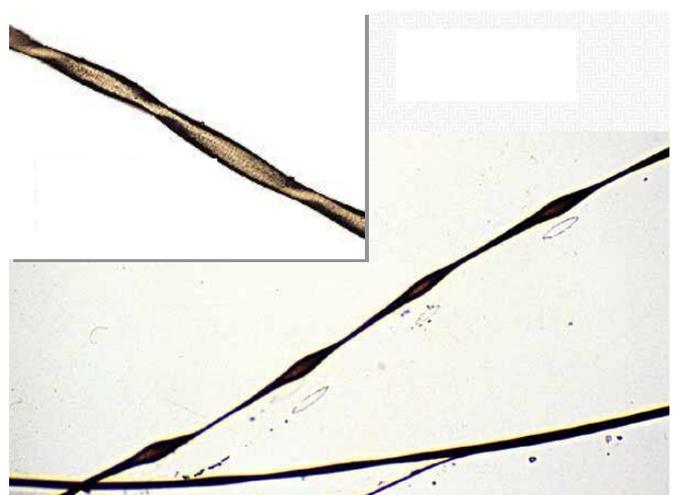
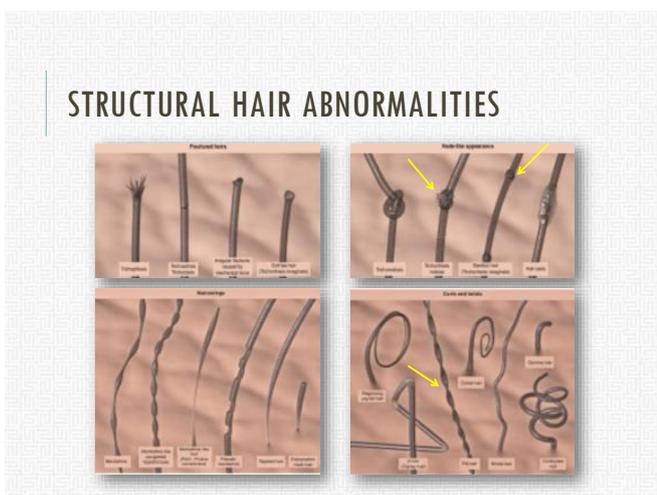
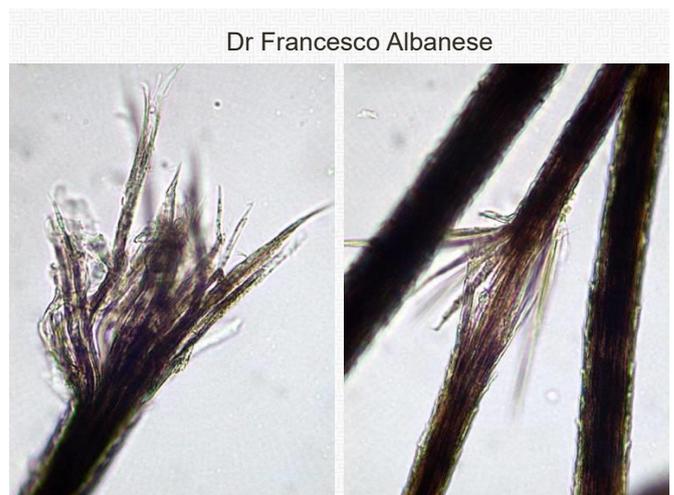
CONGENITAL HYPOTRICHOSIS OF BIRMAN CATS

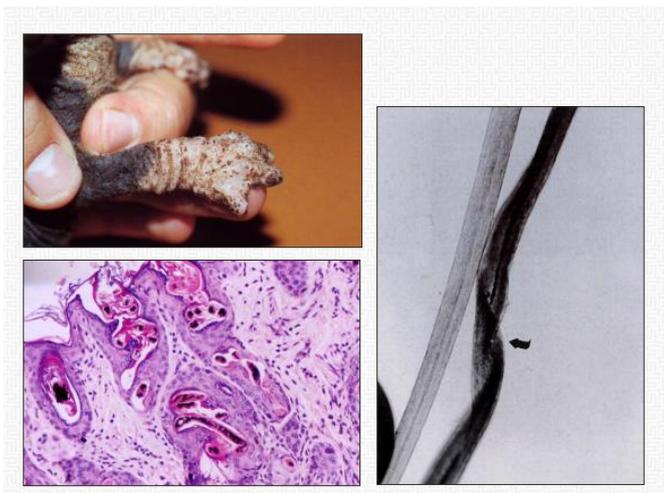
Congenital hypotrichosis and severe respiratory signs due to FOXN1 deletion

FOXN 1: expressed in epidermis, hair follicle and thymus

Thymic aplasia and spleen lymphocytic depletion

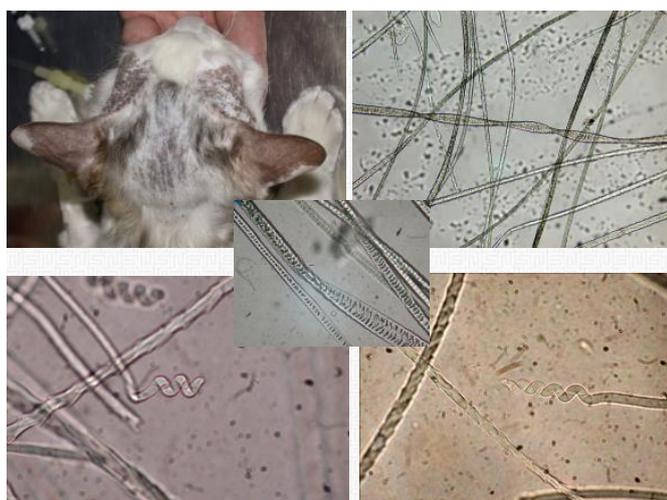
RESEARCH ARTICLE
A Deletion in FOXN1 Is Associated with a Syndrome Characterized by Congenital Hypotrichosis and Short Life Expectancy in Birman Cats
Marie Akhbari^{1,2*}, Philippe Basse^{1,2}, Anne Thomas¹, Laurent Tsiang^{1,2}
1 LABORATOIRE INSERM U1012, CHU de Caen, France, 2 INSERM—Généraliste Médecine Compensée des Affections Neurocutanées, Ecole nationale vétérinaire d'Alfort, Maisons-Alfort, France, 3 Allergologie, Le Tour de Saclay, France
* m.akhbari@univ-lyon1.fr





BREED RELATED DISEASES

- Persian
 - Dermatophytosis
 - Cystadenomatosis
 - Dirty face disease
- Bengal
 - Nasal hyperkeratosis
- Sphynx and Devon rex
 - Urticaria pigmentosa-like
 - Malassezia
 - Actinic keratosis and squamous cell carcinoma

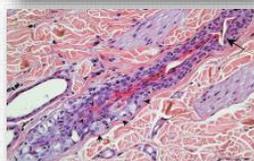


DISEASES OF THE PERSIAN CAT



ABNORMALITY OF SEBACEOUS GLANDS

- Sebaceous gland dysplasia
 - abnormal sebaceous gland morphology.
 - progressive hypotrichosis
 - scaling and crusting
 - lesions appear at between 4 and 12 weeks of age



DERMATOPHYTOSIS





APOCRINE CYSTADENOMATOSIS



DISEASES OF SPHYNX AND REX



DIRTY FACE DISEASE



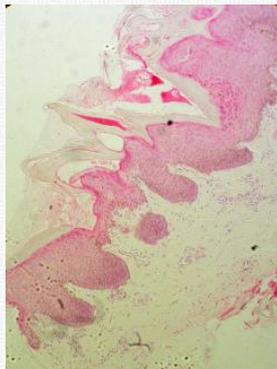
URTICARIA PIGMENTOSA-LIKE DISEASE

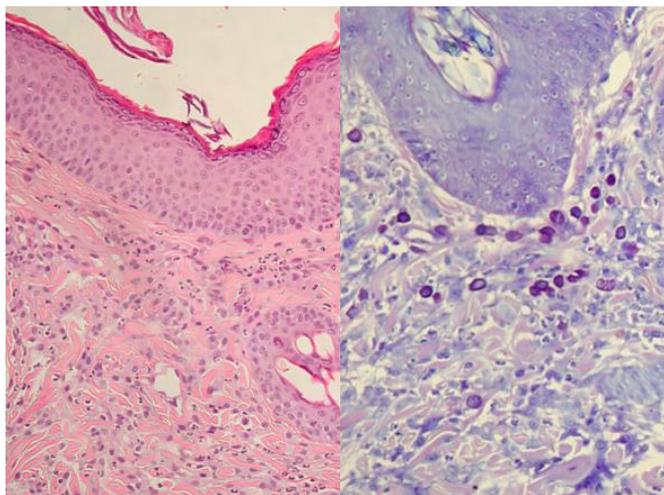


Infiltration of eosinophils and mastcells in the dermis
Variable pruritus



BENGAL CAT NASAL HYPERKERATOSIS





ACTINIC KERATOSIS AND SQUAMOUS CELL CARCINOMA



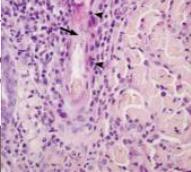
Sunburn Prevention for Cats



URTICARIA PIGMENTOSA AND DERMATOPHYTOSIS

Journal of Feline Medicine and Surgery
<http://jfm.sagepub.com>

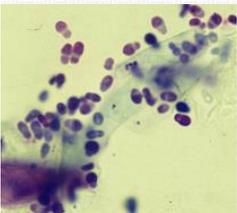
Dermatophytosis and papular eosinophilic/mastocytic dermatitis (urticaria pigmentosa) in three Devon Rex cats
Silvia Colombo, Fabia Scarpella, Laura Ordeix and Paola Rocobian
Journal of Feline Medicine and Surgery 2012 14: 498
DOI: 10.1177/1098612X12440781



ENVIRONMENTAL DISEASES IN NAKED CATS



**MALASSEZIA
GREASY SEBORRHEA
OTITIS
PARONYCHIA**





ušesna raztopina za pse in mačke zdravi AKUTNO VNETJE ZUNANJEGA SLUHOVODA

BOROVA KISLINA učinkovito deluje proti glivi *Malassezia sp.* in številnim bakterijam.

GLIKOLNA KISLINA odstranjuje odmrle površinske celice.
CERAMIDI kompleksni sfingolipidi, ki onemogočajo vstop mikroorganizmov in alergenov v kožo sluhovoda. Skrbi za obnavljanje kože.



ušesna raztopina za pse in mačke preprečuje in zdravi KRONIČNO VNETJE ZUNANJEGA SLUHOVODA

CINKOV GLUKONAT - kompleks cinkovega glukonata, lizina in tavrina, zagotavlja visoko razpoložljivost cinka v najglobljih plasteh kože zunanlega ušesa, ki pospešuje regeneracijo poškodovane kože, deluje proti srbečici, protimikrobno in protivnetno.

Melisa veterina d.o.o

Obrtniška ulica 1, Lukovica

Tel: 070 333 310

www.melisasi.si



NE V ZAŠČITITE GA LE NA POL

NexGard SPECTRA™

Z dajanjem Nexgard Spectra vsak mesec enostavno in celovito zaščitimo ne samo pred gastrointestinalnimi nematodi, temveč tudi:

- > pred najmočnejšimi infestacijami z bolhami in klopi.
- > pred smrtno nevarnimi pljučnimi črvi in srčno glisto.
- > pred nevarnostjo zoonoz.



Bolhe



Klopi



Pljučni črvi



Srčna glista



Valjasti črvi



Kavljasti črvi



Bičeglavci

SAMO ZA STROKOVNO JAVNOST.

