

Exotic Companion Mammal Dermatological Disease

Peter G. Fisher, DVM, DABVP (Exotic Companion Mammal)

Pet Care Veterinary Hospital, Virginia Beach, VA, USA

Dermatological conditions are common in the exotic companion mammal. Causes may include ectoparasitism, underlying endocrine disease, infectious agents (bacterial, viral, fungal), conditions related to anatomy such as obesity or pain from osteoarthritis that inhibits grooming behavior, environmental influences where poor husbandry/housing substrate lead to secondary traumatic injuries with or without bacterial complications, or behavioral dermatopathies stemming from stress or boredom. Clinical signs vary with the underlying etiology and can range from severe erythema and excoriations, hyperkeratosis and seborrhea resulting from the intense pruritus associated with ectoparasitism, to the alopecia without dermatitis we associate with endocrinopathies.

BEHAVIORAL DERMATOPATHIES

The behavioral dermatopathies include those dermatological conditions in which the mind, or emotions, play a major role in the development of and/or maintenance of the skin disorder. The complex overlap between psychiatric and dermatological disease has led to an awareness of the need for a multi-disciplinary approach to many skin disorders. Stress and boredom are words frequently used to describe causes for the development of these conditions.¹ However, these terms are used in a very non-specific way and greatly oversimplify what are extremely complex, multi-factorial conditions. The psychophysiological disorders are skin disorders that can be precipitated by stress. It is possible that stress of varying degrees, and that occurs at varying periods during development, plays an important role in many behavioral dermatopathies, resulting in some overlap of causation. To further complicate matters, the non-verbal characteristic of our patients means that we can never truly know what they are experiencing, thus cutaneous sensory disorders may never be well understood and the potential for pain, discomfort or other forms of altered sensation to be the driving cause behind a skin lesion must never be underestimated. In small mammals, it is possible that fur plucking or chewing in chinchillas and guinea pigs may fall under this category but the etiology of most of the behavioral dermatopathies in animals remains unclear. Future research into the genetics of behavior and the role of temperament should continue to shed light on why some animals develop these problems.

PERINEAL SOILING AND DERMATITIS

Rabbits often present with matted and soiled perineal fur with secondary dermatitis. Causes include inappropriate diet and subsequent soft stools or diarrhea, urine leakage as the result of infection or excessive crystaluria (bladder sludge syndrome), environmental factors resulting in behavioral urine retention, and decreased ability to groom due to obesity or pain.² A work up includes using case history, physical exam and imaging to determine underlying cause.

Ruleout inappropriate diet and subsequent soft stools or diarrhea as a cause.

Assess patient history; dietary and environmental. Is the rabbit on grass-based hay and pellets? Does the patient get plenty of exercise and opportunities to urinate? Is the patient obese and unable to groom the perineum?

Assess for underlying patient pain by history, physical exam and spinal and joint radiographs and judicious use of long-term analgesics where indicated.

If suspect bladder sludge syndrome; realize it is often managed versus cured with the goal being to diminish the degree of crystaluria so that it is subclinical.

Management includes ruling out underlying infectious cystitis via bacterial culture and antibiotic sensitivity of an uncontaminated urine sample preferably obtained via cystocentesis.

CHIN AND NECK DERMATITIS SECONDARY TO DENTAL DISEASE

Chin and neck dermatitis secondary to dental disease is not uncommon in the rabbit and occasionally seen in the guinea pig and chinchilla as well. The oral discomfort associated with overgrown cheek teeth

causes hypersalivation which soaks the fine fur on the chin and ventral neck of the exotic companion herbivore. This leads to a secondary localized moist dermatitis. One study looked at the possible association between Dermatological (DD) and Oro-Dental Disorders (ODD) in rabbits in southern Italy.³ Two-hundred-twenty-two medical records of rabbits seen in several veterinary clinics nearby Naples were retrospectively evaluated and there was a statistically significant increase in not only localized chin dermatitis but an increase in other dermatologic conditions as compared to rabbits with normal dentition.³ It is possible the dental disease affected the rabbits ability to groom properly thus leading to increased incidence of a variety of dermatopathies.

ULCERATIVE PODODERMATITIS (SORE HOCKS)

Ulcerative pododermatitis (sore hocks) describes a condition of the foot that encompasses a range of clinical presentations including mild erythema, superficial to deep ulcerations, and deep ulcerations with concurrent osteomyelitis. It is a common condition in rabbits, guinea pigs, rats, and many avian species. In rabbits and rodents, 'ulcerative pododermatitis' or 'sore hocks' are the terms used to describe ulcerated infected areas of skin on the caudal aspect of the tarsus and metatarsus and occasionally the metacarpus and phalangeal region of the front limbs.^{4,5} Avascular necrosis of the plantar (or palmar) aspect of the feet may be a more accurate term to describe this condition.^{4,5} Disease is multifactorial; overweight, inactive rabbits on poor plane of nutrition are kept on wire or other abrasive surface which leads to increased pressure over the bony prominences. This along with damp, dirty bedding leads to infection. May progress and worsen to point where tendon displacement occurs with resulting increased metatarsal contact with flooring. A multimodal approach to treatment should be used to manage patients with pododermatitis. Treatment of pododermatitis in all species is aimed at correcting the underlying causes, relieving pressure on the affected area(s), reducing swelling, establishing drainage (if applicable), treating any secondary infection, and addressing the associated pain and inflammation. Treatment will depend on the severity of the lesions. Concurrent disease conditions, nutritional deficiencies, and the patient's pain, stress, and anxiety levels should also be addressed. A combination of medical and surgical options as well as alternative options such as natural remedies, herbal therapy, therapeutic laser, and acupuncture, should be employed when feasible.

SEBACEOUS ADENITIS - RABBIT

A case report from the Dermatology Group, Division of Veterinary Clinical Sciences, Easter Bush Veterinary Centre, The University of Edinburgh, Roslin, Scotland describes the successful management of sebaceous adenitis diagnosed in a 15 month old FS Lionhead rabbit.⁶ Diagnosis was based on clinical signs of chronic multifocal, circumscribed, hyperkeratotic crusts and patchy alopecia, along with supportive histopathology of skin biopsies which showed orthokeratotic hyperkeratosis, absence of sebaceous glands and mural lymphocytic folliculitis. 12 weeks of oral Cyclosporine A (CsA) and a triglyceride solution (Miglyol 812) resulted in a 28.5% improvement of the dermatology service's Rabbit Dermatitis Extent and Severity Index (RDESI).⁶ At this time topical phytosphingosine products, designed for the treatment of seborrheic conditions on dogs and cats, were added to the oral protocol. Nine months later, the rabbit was still receiving all medications and there was evidence of significant hair regrowth with a 91.0% improvement from the original RDESI score. Topical phytosphingosine sprays, shampoos and spot-on treatments are designed to restore and repair the endogenous lipid barrier of the epidermis. They reduce seborrhea by reduction of transepidermal water loss, restoration of the epidermal barrier and reduction of percutaneous absorption of allergens.

GUINEA PIG OVARIAN CYSTS

The vast majority of guinea pig sows will develop ovarian cysts.

Ovarian cysts in guinea pigs are frequently but not always derived from the rete ovarii.⁷ Other possible sources of ovarian cysts are periovarian structures, overgrown Graafian follicles, neoplasia, and infection.⁷

Many clinical signs classically associated with ovarian cysts (including bilateral, non-pruritic alopecia of the flanks) are likely the result of excess steroid production by follicular cysts. Rete cysts are not believed to be steroidogenic.

The most sensitive diagnostic test is abdominal ultrasonography, while the most specific is histopathologic analysis of the cysts. Hematology, serum biochemistry, serum hormone levels, radiography, and fluid cytology are neither sensitive nor specific.

Ovariohysterectomy is the definitive treatment for all ovarian cysts. Ovariectomy without hysterectomy is not recommended, as ovarian cysts have been associated with several uterine diseases.

Medical therapies include hormone injections and percutaneous cyst drainage. Treatment with hormone injections may cause resolution of follicular cysts, but will not likely affect other types of cysts.⁷ Cysts will often refill with fluid shortly after drainage.

DERMATOPHYTOSIS

Superficial fungal dermatopathies may be seen in any of the exotic companion mammals. Most commonly associated with *Trichophyton mentagrophytes* or *Microsporum gypseum* the infected patient presents with a crusting, scaling dermatitis most commonly affecting the face, ears and feet. Confirm diagnosis with a dermatophyte culture. Treatment may include topical chlorhexidine and ketoconazole shampoos or lym sulfa dips repeated weekly with or without oral itraconazole therapy.

CUTANEOUS NEOPLASMS

The most common skin tumors in ferrets, in order of frequency, are mast cell tumors, sebaceous epitheliomas, cutaneous hemangiomas, preputial gland tumors, and lymphoma.⁸

The most common skin tumors in rabbits, in order of frequency, are basal cell tumors, spindle cell sarcomas, collagenous hamartomas, squamous papillomas, and mammary gland adenocarcinomas.⁸

The most common skin tumors in guinea pigs, in order of frequency, are trichofolliculomas, lipomas, trichoepitheliomas, and mammary gland adenocarcinomas.⁸

ECTOPARASITES

Ectoparasites create pathology via ingestion of blood, lymph, sebaceous secretions and scavenging skin debris, and as a result of the hypersensitivity to parasite antigen that results in severe pruritus and subsequent self-trauma induced lesions. This pruritic dermatosis may manifest as varying degrees of erythema, excoriations, crusts, hyperkeratosis, alopecia, secondary bacterial dermatitis and in guinea pigs seizure-like behavior may occur. Ectoparasites that result in skin disease in exotic companion mammals include mites, lice, fleas, ticks, fly-strike or helminths. Transmission can occur directly by contact with an infested animal of the same species or other household pets, wild animals or indirectly through infested food, or contaminated environment e.g., bedding material. Transmission may also be airborne in origin or via fomites such as the clothing or shoes of people. Diagnosis is mainly based on direct and microscopic visualization of ectoparasites, microscopy of trichograms, tape preparations and skin scrapings. Lack of licensed antiparasitics for use in exotic species in most countries requires off-label use of adequate pharmaceuticals. Multiple papers have demonstrated the safety and efficacy of both ivermectin and selamectin for the treatment of ectoparasites in exotic companion mammals. In certain species drug contraindications have to be considered based on reported adverse reactions. Use of fipronil in rabbits is one such example and is contraindicated.

Demodex: Demodex spp.(D. aurati, D. caviae, D. cunicoli, D. criceti, D. merioni, D. ratt, D. ratticolai)

Clinical demodicosis in exotic mammals with the exception of hamsters is rare. Infection in other species such as ferrets, gerbils, guinea pigs, rabbits, brown rats is most often associated with concurrent immunosuppression resulting from such factors as overcrowding, poor nutrition and husbandry or concurrent disease.^{9,10,11,12}

Sarcoptes scabiei*, *Notoedres cati

Rabbits with *Notoedres cati* infections develop cutaneous lesions characterized by hypotrichosis, erythema, and thick brown to grey crusting lesions. Skin mange due to *Sarcoptes* spp. may occasionally be seen in the ferret.⁹ Infected ferrets will display intense itching accompanied by a scabby yellow and red rash. Zoonotic potential exists with this mite.

Sarcoptidae: *Trixacarus caviae*

In guinea pigs *Trixacarus caviae* is the most important mange ectoparasite. Asymptomatic carriers exist, and individuals or groups of guinea pigs kept for longer times in isolation suddenly can develop clinical signs, many times after stressful situations such as hypovitaminosis C, pregnancy or suboptimal husbandry.⁹ Because *Trixacarus* spp. burrow and tunnel into the skin, they often elicit a cell-mediated immune response resulting in a severe pruritus with subsequent erythema, crusts, hyperkeratosis, alopecia, and secondary bacterial dermatitis. Scratching induced self-trauma lesions on head and neck may be the first clinical signs. Affected animals often lose bodyweight and in severe cases intense pruritus has been associated with seizure-like behaviour. One study looked at the efficacy and safety of a single dose of topical selamectin (15 mg/kg) for the treatment of *Trixacarus caviae* in naturally infected guinea pigs as compared to a more standard protocol of subcutaneously administered ivermectin (400 ug/kg SC).¹³ The study suggested that a single topical application of selamectin at a dose of 15 mg/kg is both effective and safe in eliminating mites from guinea pigs naturally infected with *T caviae* mites.¹³

Otodectes cynotis

The ear mite infestation with the psoroptidae, *Otodectes cynoti*, affects ferrets as well as other small animals. Frequently it can be detected in the external auditory meatus in young and elder ferrets which have close contact with infected ferrets, cats or dogs. They often create an abundance of dark, crumbly or black waxy debris in the ear canal. Mites may occasionally spread to other parts of the head, neck, and body. In severe cases the mites may destroy the eardrum, causing deeper infections of middle or inner-ear.^{9,14}

Psoroptes cuniculi*, *Chorioptes cuniculi

Ear mite infestation, also called "ear canker", in rabbits can be mild to severe resulting in reddish-brown crusting lesions of the ear canal, pruritus and head shaking. Infestation may also spread over to ectopic regions causing alopecia, head tilt or an aural hematoma.^{9,10}

Caparinia tripilis*, *C. erinacei

Caparinia sp. is the most common mite affecting the pet African hedgehog. Similar to the Sarcoptidae, these mites burrow into the skin where they form clusters. Hedgehogs with mite infestation show alopecia, spine loss, powdery deposits around the eyes and nose, and encrusted skin lesions especially at the ears.¹⁵ Pruritus may cause self-trauma resulting in a crusty, scabby dermatitis, with or without a secondary bacterial dermatitis.¹⁵

Myocoptes musculinus*, *Myobia musculi*, *Radfordia ensifera*, *Notoedres muri

Fur mites are found to occur more often in mice than in rats, with *Myocoptes* and *Radfordia* being most commonly reported.^{9,10,16} Fur mite infestation is characterized by alopecia, excoriations, dermatitis, and a dull hair coat. Skin lesions can be detected in all areas of the body, but especially the ears and head (*Myobia musculi*) or along the back (*Myocoptes musculinus*).

SURFACE MITES: FUR MITES

Cheyletiella parasitivorax

Cheyletiella parasitivorax is a mobile fur mite feeding on the skin, creating grey-white flaky, sometimes oily skin scaling with a powdery appearance.^{9,17} When mites can be seen moving under the scales it is called "walking dandruff". Distribution of alopecia and scales typically shows a symmetrical V-pattern on shoulder and dorsum. The mite is zoonotic and can cause an itching dermatitis even in dogs, cats, and humans.¹⁸ Eggs are fixed to the hair shaft a few millimeters above the skin layer. For detection, comb out dandruff onto dark paper observing the mite movements and microscopy scrapings.

Leporacarus gibbus

Leporacarus gibbus is another rabbit fur mite. Affected animals show a scaly alopecia, and sometimes self-mutilating behavior due to a hypersensitivity reaction is recognized.¹⁸

Chirodiscoides caviae

The so called guinea pig fur mite *Chirodiscoides caviae* can be found clinging to the hair shaft in animals immunosuppressed or with poor condition. Rough hair coat, erythema, alopecia and scratching induced dermatitis.^{9,19}

Ornithonyssus bacoti*, *O. sylvariumi*, *Dermanyssus gallinae

Avian mites can feed on mammals (including men) if the usual bird host is unavailable. One case reports a *Dermanyssus gallinae* infestation in birds with transmission to degus kept together in the same household.^{9,20} The tropical rat mite, *Ornithonyssus bacoti* can affect humans as well as degus, rabbits, gerbils, hamsters, pygmy African hedgehogs, mice, and rats.^{9,21-23} Detection of adult parasites is possible by macroscopic examination of host and environment. Diagnosis by naked eye or microscopy may show black coloured, or after a heavy blood meal red coloured mites, with a typical dorsal shield tapering posteriorly and a hairy dorsum.

LICE

According to their feeding manner, lice belong to either the suborder Anoplura (sucking lice), which are characterized by a head that is narrower than the abdomen and thorax or Mallophaga (chewing lice), which have a head that is as wide as their thorax.⁹ Because the females glue the eggs to the hairs, diagnosis is easier by confirming these nits with a magnifying glass. With a strip of adhesive tape hairs can be detached in the region of crust formation and examined under a microscope.

Polyplax serrata (mice, rat) and *P. spinulosa* (rat) are the most common blood-sucking lice in mice and rats.^{9,10} Young, under fed hosts are more often diseased. Severe anemia, alopecia and pruritus can be detected. Constant scratching, particularly behind the ears is often noted.

Gyropus ovalis and *Gliricola porcelli*, debris feeding lice, are common in guinea pigs. Adults of both species are up to 1.5 mm long (*Gyropus* slightly smaller), yellow-grey coloured, often attached to the hair shafts.

Haemodipsus ventricosus, the rabbit louse, is infrequently found on dwarf rabbits.

TICKS

Ixodes ricinus, *I. hexagonus*, *Ripicephalus sanguineus*, *Haemaphysalis erinacei*, *H. leporisplalustris*, or *Dermacentor variabilis*. Ticks may be diagnosed in ferrets, hedgehogs, and rabbits housed outdoors, or in hunting ferrets. In northeastern United States rabbits are commonly parasitized by *Ixodes scapularis*, *I. dentatus*, *Haemaphysalis leporisplalustris*, or *Dermacentor variabilis*.^{9,24} In hedgehogs mostly *Ixodes ricinus* infestations can be diagnosed.

FLEAS

Ctenocephalides spp., *Ceratophyllus sciorum*, *Pulex irritans*, *Nosopsylla* spp., *Spilopsyllus cuniculi*, *Xenopsylla* spp. Flea infestation in chinchillas, ferrets, hedgehogs, mouse and rats due to direct transmission or indirectly via a flea-infested environment can be detected. Captive chinchillas, mice, rats, rabbits etc. housed with infested dogs or cats may also become infested with *Ctenocephalides* spp. If exposed to wild rats or mice *Nosopsylla* spp. or *Xenopsylla* spp. can be detected in pet rodents.⁹ Wild rabbits infested with the rabbit flea, *Spilopsyllus cuniculi*, may serve as an important vector in transmission of myxomatosis.^{9,25} Flea infestation may be asymptomatic, but can also cause clinical signs with affected animals showing dull hair coats, pruritus, flea-bite hypersensitivities and secondary bacterial dermatitis. In severe cases anemia and death can occur. Identification of fleas or flea excrements confirms the diagnosis.

HELMINTHS

Cuterebra spp. Cuterebriasis can occur if ferrets, rabbits, etc. are housed outdoors in times of warm weather. The hatched larvae of *Cuterebra* flies can crawl into the fur, then enter the subcutis through body openings. The resultant swelling has a typical breathing hole visible at the skin surface. Larvae of 1 to 3 cm length can be visualized within the lesion. Extraction of larvae without damage, followed by debridement of necrotic tissue can be done after incising the skin through the breathing hole.

Wohlfahrtia vigil, Lucilia, Calliphora spp. Myiasis or fly strike is common in the rabbit with exposure to outdoor environment in warmer months. Typically seen in soiled perineum or inguinal regions.

REFERENCES

1. Tynes VV. Behavioral dermatopathies in small mammals. *VCNA, Exotic Animal Practice*. 2013;16(3):801–820.
- Fisher PG. Standards of care in the 21st century: the rabbit. *JEPM*. 2010;19(1):22–35.
- d'Ovidio D, Santoro D. Oro-dental diseases and dermatological disorders are highly associated in pet rabbits: a case-control study. *2013 Proceedings Annual Conference AEMV*. Indianapolis.
- Blair J. Bumblefoot: a comparison of clinical presentation and treatment of pododermatitis in rabbits, rodents and birds. *VCNA, Exotic Animal Practice*. 2013;16(3):715–735.
- Harcourt-Brown F. Skin diseases. In: *Textbook of Rabbit Medicine*. Oxford: Butterworth-Heinemann; 2002:233–240.
- Kovalik M, Thoday KL, Eatwell K. Successful treatment of idiopathic sebaceous adenitis in a Lionhead rabbit. *JEPM*. 2012;21(4):336–342.
- Bean AD. Ovarian cysts in the guinea pig (*Cavia porcellus*). *VCNA, Exotic Animal Practice*. 2013;16(3):757–776.
- Kanfer S, Reavill DR. Cutaneous neoplasia in ferrets, rabbits and guinea pigs. *VCNA, Exotic Animal Practice*. 2013;16(3):579–598.
- Fehr M, Koestlinger S. Ectoparasites in small exotic mammals. *VCNA, Exotic Animal Practice*. 2013;16(3):611–657.
- Hoppmann E, Barron HW. Ferret and rabbit dermatology. *J Exotic Pet Med*. 2007;16(4):238–55.
- Zwart P, Treiber A. Gerbil. In: Gabrisch K, Zwart P, eds. *Heimtierkrankheiten*. Hannover: Schlütersche; 2008:163–182.
- Schönfelder J, Henneveld K, Schönfelder A, et al. Concurrent infestation of *Demodex caviae* and *Chirodiscoides caviae* in a guinea pig. *Tierärztl Prax*. 2010;91(1):28–30.
- Eshar D, Bdolah-Abram T. Comparison of efficacy, safety, and convenience of selamectin versus ivermectin for treatment of *Trixacarus caviae* mange in pet guinea pigs (*Cavia porcellus*). *JAVMA*. 2012;241(8):1056–1058.
- Kelleher SA. Skin diseases of the ferret. *Vet Clin North Am Exotic Anim Pract*. 2001;4(2):565–72.
- Hoefler HL. Hedgehogs. *Vet Clin North Am Small Anim Pract*. 1994;24(1):113–20.
- Bornstein S. Mange in domesticated rats. *Vet Rec*. 1997;140(1):28–9.
- Mellgren M, Bergvall K. Treatment of rabbit cheyletiellosis with selamectin or ivermectin: a retrospective study. *Acta Vet Scand*. 2008;50:1.
- Beck W. Common ectoparasitic diseases and dematophytosis in small mammals, birds and reptiles. *Prakt Tierarzt*. 2003;10:752–62.
- Beck W. Fur mites (*Chirodiscoides caviae*) in guinea pigs. *Kleintiermedizin*. 2002;1:10–4.
- Sassenburg L. Degu. In: Gabrisch K, Zwart P, eds. *Diseases of Exotic Pets*. Hannover: Schluetersche; 2008:215–238.
- Leonatti SR. *Ornithonyssus bacoti* mite infestation in an African pygmy hedgehog. *Exotic DVM*. 2007;9:3–4.
- Fox JG. Outbreak of tropical rat mite dermatitis in laboratory personnel. *Arch Dermatol*. 1982;118:767–8.
- Creel NB, Crowe MA, Mullen GR. Pet hamsters as a source of rat mite dermatitis. *Cutis*. 2003;71:457–61.
- Magnarelli LA, Norris SJ, Fikrig E. Serum antibodies to whole-cell and recombinant antigens of *Borrelia burgdorferi* in cottontail rabbits. *J Wildl Dis*. 2012;48(1):12–20.
- Sobey WR, Conolly D. Myxomatosis: the introduction of the European rabbit flea *Spilopsyllus cuniculi* (Dale) into wild rabbit populations in Australia. *J Hyg (Lond)*. 1971;69(3):331–46.