Dermatologic Problems in Guinea Pigs

University of California, Davis
Stephen D. White, DVM, DACVD

Ecole Nationale Vétérinaire de Nantes, France
Patrick J. Bourdeau, DV, DECVD

University of Edinburgh
Anna Meredith, MA, VetMB, CertLAS, CertZooMed, MRCVS

ABSTRACT: Skin disease may be the most common reason that owners take their guinea pigs to a veterinarian. In addition, skin diseases are very common in laboratory colonies and may interfere with the quality and conditions of research. Most skin conditions in guinea pigs are due to infectious diseases, of which the most frequent cause is parasites. This article organizes skin diseases of guinea pigs based on the predominance of one of four clinical signs: pruritus, alopecia with minimal pruritus, excessive scaling, and nodules. Because a number of skin diseases of guinea pigs may present with variable or multiple clinical signs, it is helpful to approach these diseases according to the most likely diagnostic differential.

The importance of the guinea pig (Cavia porcellus) as a pet varies among countries. Skin diseases may be the most common reason owners of guinea pigs visit their veterinarian. In addition, skin diseases are very common in laboratory colonies and may interfere with the quality and conditions of research. Often, these skin problems are due to infectious diseases, of which the most frequent cause is parasites. Many skin diseases seen in guinea pigs can present with variable or multiple clinical signs. Therefore, these diseases should be approached according to the most likely diagnostic differential. It also is important to remember that clinical signs may vary between individual animals and that skin lesions may change with time.

This article discusses the range of skin diseases of guinea pigs and organizes them based on the predominance of one of four clinical signs: pruritus, alopecia with minimal pruritus, excessive scaling, and nodules. Miscellaneous conditions that do not fit well into this scheme are also discussed.

PRURITUS
Mites
The mite Trixacarus (Caviacoptes) caviae causes sarcoptiform mange that is arguably the most common reason for pruritus in guinea pigs. The organism causes intense pruritus and severe self-trauma, with lesions of erythema, papules, and hyperkeratosis; chronic infestation leads to alopecia and lichenification.1-4
Lesions are most commonly seen on the head, shoulders, dorsum, and flanks but may be generalized (Figures 1 and 2). Secondary bacterial infection is common and may be a cause of mortality in severe or untreated cases. Seizures and abnormal behavior may be present and can be elicited while examining affected animals. Seizures resolve with treatment of the mite infestation and do not require anticonvulsant medication. Abortion and fetal resorption may be seen in pregnant animals. A nonclinical carrier state has been noted, with cases having been observed in animals or colonies long isolated from other animals. Stressful conditions (e.g., concurrent disease, hypovitaminosis C, old age) may trigger clinical disease. Conversely, the authors have seen unaffected guinea pigs that shared a cage with severely affected animals. The mite may also cause transient dermatitis in humans.

The life cycle of *T. caviae* is 10 to 14 days. Diagnosis is made by skin scrapings that generally reveal numerous eggs and mites that resemble *Sarcoptes canis* but are smaller. The differentiation can be useful because infestation with *Sarcoptes* may originate from different mammals, whereas *T. caviae* is specific for guinea pigs (another *Trixacarus* sp is found in rats). *T. caviae* is smaller than *Sarcoptes* and lacks its typical thick and spiny dorsal setae.

Mites may not always be easily seen, and clinicians should not hesitate to treat pruritic guinea pigs presumptively when the clinical presentation is suggestive. The treatment is ivermectin (200 to 400 µg/kg SC every 10 days for three doses). All animals that have been in contact with affected animals should be treated and the housing thoroughly cleaned (lime sulfur in a 1:40 dilution with water is effective). There is evidence to suggest that ivermectin is not absorbed orally in guinea pigs. Possible side effects of SC injections of ivermectin include dermal inflammation or necrosis, which may be due to propylene glycol, a commonly used diluent.

*Chirodiscoides caviae* is the guinea pig fur mite. Barely visible, this mite is usually found clinging to the hair shaft. Pruritus, alopecia, erythema, and scaling are occasionally seen in heavy infestations. Asymptomatic infestations may be present for long periods. *C. caviae* may increase an animal’s grooming behavior to a level of self-trauma, and ulcerative dermatitis may be seen. Concurrent infestations with lice are common. *C. caviae* may be collected with combing, clear adhesive tape, or hair plucking and may be identified on microscopy. Treatment of individual guinea pigs is the same as that for *T. caviae*; in colony situations, application of ivermectin spray or aerosol has been successful. One author (P. J. B.) obtained good results with two applications of selamectin (12 mg/kg) at a 2-week interval.

*Myocoptes musculinus*, a very common fur mite observed in colonies of mice, occasionally infests guinea pigs.

**Lice**

Lice infestations are common in guinea pigs, and heavy infestations cause pruritus, erythema, and papules, especially around the ears. In guinea pigs, only biting lice (Mallophaga) are present (i.e., *Gliricola porcelli* [the most common], *Gyropus ovalis*, *Tremenopon hispidum*, *T. jenningsi*). Diagnosis is made by observing the lice and nits grossly or with a magnifying lens (Figure 3). Systemic ivermectin (200 to 400 µg/kg SC every 10 days for three doses) is usually very effective.

**Fleas**

Guinea pigs may be infested with fleas (usually *Ctenocephalides felis*). This mainly occurs in house-
Griseofulvin (15 to 25 mg/kg PO for 2 to 4 weeks) mixed in a fatty acid supplement is effective. However, griseofulvin should be used with caution in young animals and is contraindicated in pregnant females because of its teratogenicity. Eradication may be very difficult in colonies, even using the standard methods of control (i.e., disinfection, isolation and treatment of affected animals, monitoring with periodic fungal cultures).

Other oral antidermatophyte drugs have been studied in experimentally induced dermatophyte infections in guinea pigs. One such study suggested that fluconazole or itraconazole at 20 mg/kg/day PO may be useful. Terbinafine was successfully used in guinea pigs experimentally infected with *T. mentagrophytes* or *M. canis*. Clinical and mycologic cure rates were 100% when administering 40 mg/kg/day PO for 9 days. In the future, these products may be used more frequently in pet guinea pigs.

Experimentally, skin lesions can be produced in guinea pigs by the cutaneous application of *Candida albicans* and *Malassezia ovale*, but the significance of these organisms in causing spontaneous lesions is unclear. One author (P. J. B.) has seen cases of cheilitis associated with *C. albicans*.

### Bacteria

*Staphylococcus* spp infections are common in guinea pigs. They are often secondary to unsanitary conditions, bites, excessive grooming, ectoparasites, and foreign body granulomas. Acute or chronic skin diseases are observed. *Staphylococcus* spp infections may cause alopecia, erythema, superficial suppurative lesions, crusts, abscesses, ulcers, and folliculitis with variable pruritus. Systemic signs (e.g., diarrhea, abortion, respiratory distress) are occasionally present. Diagnosis is based on skin cytology and, if possible, bacterial culture and susceptibility. Guinea pigs are highly susceptible to enterotoxemia resulting from antibiotic-induced destruction of the predominantly gram-positive flora, which allows the overgrowth of *Clostridium difficile* and hemorrhagic typhilitis.

β-lactam antibiotics should be avoided for treating bacterial infections, if possible. Because of the wide spectrum and good tolerance of fluoroquinolones, they are the first choice for guinea pigs. The suggested dose of the fluoroquinolone enrofloxacin is 5 to 20 mg/kg PO or SC q12h. Primary underlying conditions must be corrected.

### Mites

*Demodex caviae* may rarely cause alopecia, erythema, papules, and crusts. These lesions are most commonly associated with cats and/or dogs, both of which are sources of the infestation. Pruritus, alopecia, crusts, and anemia may be present. The safety of using the newer canine and feline spot-on adulticides in guinea pigs is unknown. In general, aqueous-based pyrethrin sprays for cats are probably the safest treatment modalities.

**Figure 3**—Nit of the louse *G. porcelli* adhered to a hair shaft.
Free-Living Nematodes

*Pelodera strongyloides* has been associated with alopecia, ventral erythema, and papules. This helminth is normally not parasitic but may occasionally invade hair follicles, causing clinical signs. The follicular penetration of larvae may favor inflammation, but larvae cannot develop into adults in the host. Diagnosis is based on observation of larvae in skin scrapings or biopsies. Definitive identification is based on demonstration of adults in bedding (generally, hay in humid or moist environments). Treatment requires removal of contaminated bedding and maintaining a dry environment in the cage. In addition, guinea pigs may be bathed in a mild antibacterial solution (1% to 2% chlorhexidine solution) to prevent secondary infection, but a topical antiparasitic is not necessary.

Nutritional, Environmental, and Behavioral Conditions

**Hypovitaminosis C**

Guinea pigs, like primates, cannot synthesize vitamin C; thus any diet must supply adequate amounts. Vitamin C deficiency can lead to alopecia and a rough, unkempt haircoat. A predisposition to cheilitis is also associated with hypovitaminosis C. Treatment consists of correcting dietary deficiencies, such as replacing food formulated for other rodents or guinea pig food 90 days past the milling date. Vitamin C (50 to 100 mg/kg/day SC) should also be given until signs resolve, followed by regular supplementation (15 to 25 mg/kg/day PO); pregnant sows should receive 30 mg/kg/day.

**Stress**

Stressed or ill guinea pigs frequently shed large amounts of hair, possibly resulting in part from an increased requirement for vitamin C. Fur chewing and barbering of other guinea pigs is often associated with a lack of dietary fiber, stress, and overcrowding. Ear chewing is also occasionally seen. Lack of fiber is an important problem in breeding colonies, where both the feeding of fiber (including hay and pellets) and access to it by all animals may affect haircoat quality.

Endocrinopathies

**Reproductive Hormones**

It is common to see sows with nonpruritic bilateral flank alopecia during late pregnancy. Females that are bred often lose hair in the last part of gestation (Figure 4). Alopecia may worsen with each pregnancy. The hair generally regrows within 3 to 4 weeks after parturition. It is unknown whether the alopecia is due to telogen defluxion from reduced anabolism of maternal skin associated with fetal growth or to failure to obtain sufficient nutrition at the end of pregnancy. Diagnosis is based on reproductive history and ruling out other causes of alopecia, such as dermatophytosis, barbering, nutritional deficiencies, ovarian cysts, and ectoparasites.

Cystic ovarian disease is extremely common in aged female guinea pigs, with various reports showing at least a 76% incidence in animals 1.5 to 5 years of age. The cause is unknown, although estrogenic substances in hay have been implicated. Initially, cysts may be asymptomatic; however, as they increase in size, non-pruritic alopecia develops over the back and symmetrically over the flanks (Figure 5). Abdominal enlargement and infertility may also be evident.

Diagnosis is based on history, abdominal palpation, radiography, and ultrasonography. The cysts are usually bilateral and may be up to 10 cm and painful on palpation. They are often associated with concurrent cystic endometrial hyperplasia, mucometria, endometritis, and fibroleiomyomas. Ovariohysterectomy is the preferred treatment; however, the use of human chorionic gonadotrophin (1,000 USP IM every 7 to 10 days) has been reported to temporarily resolve this condition. Ultrasonography should be used to distinguish between ovarian cysts and ovarian neoplasia because radiography cannot be used to determine the inner structure of the mass. Percutaneous drainage of the cysts may also be possible under anesthesia.

**Miscellaneous Endocrine Disease**

There is one report of a 5-year-old guinea pig with bilateral alopecia, obesity, and lethargy that was diag-
nosed with an adrenal tumor via ultrasonography. The animal died after an adrenalectomy. Necropsy showed that the left adrenal gland tumor was an adenoma and the right adrenal gland also had multiple small adenomas, although (grossly) it appeared normal.

Hereditary Disease

Hereditary alopecia has been reported in guinea pigs. Hairless guinea pigs are frequently used in research. In one report, newborn hairless guinea pigs were smaller than littermates, had wrinkled skin, and had stunted vibrissae. The most striking histologic abnormality was distention of the upper portion of the pilary canal, with thickening of the epidermis. Preliminary work indicated that in addition to hairlessness, the guinea pigs were athymic or hypothythic. However, euthymic hairless guinea pigs also exist.

SCALING AND CRUSTING

An important early cutaneous sign of hypovitaminosis C is scaling of the pinnae. Inadequate dietary levels of vitamin C or anorexia rapidly lead to clinical signs. Guinea pigs have an absolute vitamin C dietary requirement of 15 to 25 mg/kg/day, which increases to 30 mg/kg/day during pregnancy.

Other causes of scaling and crusting are infrequent. As a result of epidermal cleavage through the stratum granulosum, *Staphylococcus aureus* has reportedly caused erythema and exfoliation of the epidermis in colonies of guinea pigs. *Cheyletiella parasitivorax* occasionally produces pruritus and scaling along the dorsum. Treatment is with ivermectin (200 to 400 µg/kg SC every 10 days for three doses). Hyperkeratosis and cutaneous horns can develop on the footpads, especially in heavy guinea pigs and those on wire-bottomed cages. These lesions can be clipped or filed away. Hairless guinea pigs experimentally infected with herpes simplex virus have developed spontaneously regressive pustular and crusted dermatosis.

NODULES

Infectious Diseases

Bacteria

Pododermatitis (“sore hocks”) is relatively common in guinea pigs. *S. aureus* is generally isolated, although *Corynebacterium pyogenes* may also be found. Obesity, poor hygiene, hypovitaminosis C, and wire flooring are all predisposing factors. Lesions are bilateral on the planar aspects of the metacarpal and metatarsal areas, with a progression of erythema, hyperkeratosis, pus, necrosis, osteomyelitis, and septicemia (Figure 6). Radiography aids clinicians in determining the severity of the disease, treatment, and prognosis. Treatment involves topical antiseptics (silver sulfadiazine or mupirocin may be helpful), systemic antibiotic therapy (enrofloxacin [5 to 20 mg/kg PO or SC q12h]), bandaging, and addressing the underlying cause. However, treatment is often unsuccessful, and systemic amyloidosis often occurs as a result of chronic infection.

Cervical lymphadenitis (“lumps”) is commonly observed in guinea pigs and is caused by infection with *Streptococcus zooepidemicus*, although other organisms (e.g., *Corynebacterium pseudotuberculosis*, *Streptobacillus moniliformis*) have occasionally been isolated. Affected animals have enlarged lymph nodes in the ventral cervical or submandibular areas but often show no other signs. The involved nodes are encapsulated.
and contain yellowish-white, sometimes inspissated, pus. The affected lymph nodes may rupture to the skin surface. Involvement of other lymph nodes and/or septicemia is infrequent. Infection is theorized to be via abraded oral mucosa, but experimental infection via intact ocular and nasal mucosa has been reported. Diagnosis is made by bacterial culture of the abscess (lymph node) capsule; culture of the pus itself often results in no bacterial growth. Mildly affected animals may be treated with systemic antibiotics based on bacterial culture and susceptibility. Multiple or large lesions require surgical excision; although drainage of the nodular abscesses has been recommended, it must be accompanied by frequent flushing and systemic antibiotics, and the results are not always satisfactory.

Mycobacterial organisms (e.g., *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium*) cause caseous abscesses in the internal organs and occasionally in the subcutaneous tissues. This condition is rapidly fatal. *Mycobacterium microti* causes a more chronic disease with subcutaneous nodules and plaques.

**Parasites**

Leishmaniasis in domestic guinea pigs may cause ulcerative nodular lesions, particularly on the ears and face (Figure 7). The reported cases were from Brazil, with *Leishmania enriettii* as the causative agent. The lesions of one of these guinea pigs resolved after 15 days of treatment with meglumine antimonate at 400 mg/kg/day. *L. enriettii* and other *Leishmania* spp have been studied extensively in experimentally infected guinea pigs using various treatment regimens.

Experimentally, guinea pigs exposed to colony-bred biting midges, *Culicoides sonorensis*, developed small, superficial, cutaneous, crateriform ulcers with necrosis of the superficial dermis at feeding sites that healed within 24 to 48 hours. The guinea pigs then developed nonpruritic erythematous papules 5 days after the *Culicoides* exposure. The papules persisted until the end of the study, 12 days after the *Culicoides* feeding.

**Neoplasia**

Trichofolliculoma is the most common cutaneous neoplasm. It is benign and usually solitary and generally occurs on the dorsum. A central pore, through which keratinous or hemorrhagic material is discharged, is often seen. Complete surgical excision is curative.

Sebaceous adenoma, fibroma, fibrosarcoma, lipoma, liposarcoma, schwannoma, and lymphoma have all been reported in guinea pigs.

Tumors of fibroblastic and/or vascular origin have been reported. A poxvirus was detected in large fibrovascular proliferations in the thigh muscles of a group of 8-month-old guinea pigs. A 9-year-old female guinea pig was diagnosed with a subcutaneous fibrosarcoma overlying the ventral thorax. The mass was invasive within the subcutis without extension into surrounding structures or organ systems.

A skin lesion classified as a vascular malformation has been noted in a young adult female guinea pig. The physical examination revealed an irregularly shaped violaceous plaque located on the left caudal flank (Figure 8). The surface of the plaque was ulcerated and bled intermittently, eventually resulting in fatal blood loss. Histologic and immunohistochemical findings were consistent with a vascular malformation.

**MISCELLANEOUS CONDITIONS**

Guinea pigs possess sebaceous scent glands on the rump and perineal area. In male animals, the oily secre-
tions make the hair matted (Figure 9). Owners can mistakenly assume that this is abnormal. However, the secretions can become impacted and cause irritation. Washing the area with a mild antiseptic shampoo relieves the condition and helps prevent recurrence.

Another fairly common condition is excessive growth of the claws, particularly in obese animals or associated with pododermatitis. A careful examination of the guinea pig confirms the diagnosis, and treatment involves careful clipping of the excess growth.

Cheilitis is thought to be associated with the feeding of acidic and abrasive foods (e.g., hay, apples; Figure 10). Primary or secondary bacterial infection with *Staphylococcus* spp is common in cheilitis and may be managed by topical mupirocin. Poxxivirus has been associated with this condition in two guinea pigs with crusting, ulcerated lesions around the lips and philtrum. Hypovitaminosis C or infection with *Candida albicans* may also be implicated. Thus skin biopsy and viral/bacterial/fungal cultures may be indicated in addition to evaluating the diet. One author (A. M.) has had good success in treating cases of cheilitis by packing the ulcers with a carmellose sodium, pectin, and gelatin ointment (Orabase, Squibb). There are various Orabase formulations, some of which include hydrocortisone and/or topical anesthetics; these supplemented products should not be used in guinea pigs.

**REFERENCES**


---

**ARTICLE #4 CE TEST**

The article you have read qualifies for 1.5 contact hours of Continuing Education Credit from the Auburn University College of Veterinary Medicine. Choose the best answer to each of the following questions; then mark your answers on the postage-paid envelope inserted in *Compendium*.

1. The most common dermatophyte affecting guinea pigs is
   a. *T. mentagrophytes*.
   b. *T. mentagrophytes*.
   c. *T. mentagrophytes*.
   d. *M. ovale*.
   e. *Trichophyton porcelli*.
   f. *C. albicans*.

2. The most common parasite causing skin disease in guinea pigs is
   a. *G. ovalis*.
   b. *D. caviae*.
   c. *T. caviae*.
   d. *T. caviae*.
   e. *T. caviae*.

3. Nonpruritic alopecia over the flank in an aged female guinea pig is most consistent with a diagnosis of
   a. *L. caviae*.
   b. *N. mutans*.
   c. *P. ovale*.
   d. *T. caviae*.
   e. *C. albicans*.

4. Which of the following is the most common cutaneous neoplasm in guinea pigs?
   a. *Sebaceous adenoma*.
   b. *Melanoma*.
   c. *Sebaceous adenoma*.
   d. *Sebaceous adenoma*.
   e. *Sebaceous adenoma*.

5. Cheilitis in guinea pigs is usually not associated with
   a. *Sebaceous adenoma*.
   b. *Acidic foodstuffs*.
   c. *Sebaceous adenoma*.
   d. *Sebaceous adenoma*.
   e. *Sebaceous adenoma*.
### Skin Problems in Guinea Pigs

(continued from page 697)

6. Cervical lymphadenitis (“lumps”) in guinea pigs is most commonly caused by infection with
   a. *Staphylococcus* spp.  
   b. *L. enriettii*.  
   c. *C. difficile*.  
   d. *C. felis*.  
   e. *S. zooepidemicus*.

7. Which of the following clinical conditions is not likely to be associated with hypovitaminosis C in guinea pigs?
   a. ulcerated nodules
   b. conversion of a nonclinical carrier to a clinical infestation of *T. caviae*
   c. a rough, unkempt haircoat
   d. alopecia
   e. scaling of the pinnae

8. Which of the following statements regarding pododermatitis in guinea pigs is true?
   a. *C. pyogenes* is the most commonly isolated bacteria.
   b. Pododermatitis is rare in guinea pigs.
   c. Obesity, poor hygiene, and hypovitaminosis C are all potential causative factors.
   d. Husbandry is rarely to blame.
   e. Lesions are usually unilateral.

9. In some cases of congenital alopecia in guinea pigs, the _______ may be affected.
   a. kidneys  
   b. liver  
   c. thymus  
   d. spleen  
   e. lungs

10. The drug of choice for treating *T. caviae* infestation is
   a. ivermectin.  
   b. griseofulvin.  
   c. fipronil.  
   d. terbinafine.  
   e. enrofloxacin.