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## ZOONOTIC DERMATOSES IN CATS

Dr. Maite Verde, DVM, PhD  
Dermatology Services. Teaching Hospital. Veterinary Faculty  
University of Zaragoza. Spain

Cats are gaining popularity as pets, becoming the house held pet par excellence for many human beings (elderly, children, people that live on their own) in such a way that there are thought to be near 200 millions cats between Europe and America. Therefore the potential for infectious diseases that are transmissible from cats to humans and vice-versa (zoonosis) can be considerable. Some diseases, however, cannot be transmitted in both directions. The term "zoonotic dermatosis" refers to those zoonosis in which the etiological agent causes skin lesions in man. Transmission feline dermatosis to human beings constitute a small portion of the almost 200 well-known zoonosis recognized today in this specie. It has been estimated that over 5% of cases presented in human dermatology clinique are directly attributable to animal ectoparasites.

The simultaneous appearance of lesions on the owner and his animal, or the presence on a person of lesions restricted to areas of contact with the cat are strongly suggestive of a zoonotic dermatosis. Transmission in the house will not necessarily involve everyone because of variation in individual susceptibility. Occasionally, the owner makes the connection between his or her skin lesions and those of their cat and goes straight to the Veterinary before consulting his doctor. Obtaining a precise diagnosis for the cat's skin condition can then help in diagnosing the owner's disease for which isolating an aetiological agent is often difficult.

### FUNGAL DERMATOSIS

**Dermatophytosis** is a superficial mycosis caused by pathogenic, epidermotropic, keratinophilic and keratolytic fungi called dermatophytes. The cat is, above all, the vector of *Microrsporium canis* which is highly contagious to man. Transmission may be by direct contact or by indirect contact via contaminated hair and scale deposited in the environment (grooming equipment and transport cages). Asymptomatic carriage cat is common and estimated to occur in 15-36% of animals depending on their life style.

**In man**, exposed areas of his body such as hair, face, beard and arms, and moist areas like the inguinal region, feet and axillae, are most often affected. Skin signs are extremely pleomorphic. Glabrous regions are most commonly involved, typically with annular, erythematous lesions. Differential diagnosis must include other dermatosis: discoidal eczema, psoriasis, pityriasis rosea and annular granuloma. Hair, eyelids and eyebrows are usually involved in children. This form of dermatophytosis involves erythematous, scaly plaques in which infected and healthy hairs can both be found. Kerions are characterized by papulo-pustular lesions with deep folliculitis and perifolliculitis in a raised, semicircular lesion. Pruritus, lymphadenopathy and sometimes pyrexia could be seen.

**Diagnosis** is based on Wood's lamp examination, microscopy of hair and scale, and fungal cultures. Veterinarians are often confronted with dermatophytosis in an owner whose cat is apparently unaffected but has been identified as the source of the infection by the owner's doctor.

In such cases, submitting hair and scale for fungal culture, using the carpet square or toothbrush technique, should confirm or refute the doctor's diagnosis. Samples should also be taken from the owner to identify the causal dermatophyte. If the organism isolated is anything other than *Microrsporium canis*, the cat is unlikely to be the source of the infection.

**Sporotrichosis** is a deep mycosis, highly contagious to man, caused by a dimorphic fungus, *Sporothrix schenckii*. This infection should be suspected in cats with a non-healing wound or abscess following the use of appropriate antibiotics. Sporotrichosis is a serious zoonosis and individuals in direct contact with soil and plants should be considered at risk.

**Infection in the cat** usually results from wound contamination or penetration of a foreign body. More rarely, inhalation of spores can cause systemic illness.

**Man** usually becomes infected directly following a bite or scratch but infection can also arise by direct contact with infected tissues or fluids of affected cats.

Signs are identical to those described in the cat. The incubation period is variable (3 weeks to months). The cutaneous lymphatic form is the most common (seen in 80% of cases), characterized by a solitary nodule at the site of infection. The nodule, which eventually ulcerates, is typically seen on the back of the hand, a finger, a toe, or the face. Other nodules may appear along lymphatic vessels. The strictly cutaneous form is identical to the feline condition. The rare systemic form is probably caused by spread of infective *Sporothrix schenckii* spores via blood vessels. Usually, sporotrichosis can be treated successfully in immunocompetent people but it can be fatal in the immunosuppressed.

**Diagnosis** is based on cytology, histopathology and fungal culture. In man, diagnosing the condition on histopathology is difficult due to possible confusion with *Cryptococcus neoformans* and *Histoplasma capsulatum*.

In the cat, in addition to systemic antifungal treatment, hygienic measures must be carried out. Hands and arms must be thoroughly cleaned with antifungal agents like chlorhexidine and povidone-iodine. Wearing protective gloves are also recommended. Owners must be informed of the considerable zoonotic risk associated with this illness and euthanasia should be discussed for carrier cats because treatment is long and the risk of transmission is high.

**Blastomycosis** is a systemic mycosis, caused by the fungus, *Blastomyces dermatidis*, reported mainly in North America, but also in Africa and Central America, with well-defined endemic foci. Blastomycosis is a systemic illness seen in the dog and man, and rarely in the cat. To date, no case has been reported in Europe in the cat.

**Human infection** can occur via wound contamination (bites from infected animals, knives or needles contaminated by autopsy or aspirate). In addition to characteristic pulmonary lesions following inhalation of spores from the soil, skin lesions can occur. These may take form of papules and abscesses or sometimes proliferative, crusting nodules with a raised border.

**Diagnosis** is based on fungal culture carried out by specialist laboratories.

**Histoplasmosis** is a systemic mycosis, caused by a dimorphic fungus, *Histoplasma capsulatum*. There are two varieties of this fungus: var.*capsulatum* (American histoplasmosis) and var.*duboisii* (African histoplasmosis). The disease is endemic in the southern United States and also in many tropical countries. It is reported sporadically in other parts of the world, notably Europe. Histoplasmosis is a systemic disease seen in the dog, cat and man. The disease is contracted by inhalation of spores from contaminated soil, contact with contaminated bird or by faeces or by contact with wounds contaminated by the fungus.

**In man**, histoplasmosis is a marker for AIDS. American histoplasmosis is characterized by mucocutaneous lesions such as gingivitis and well-circumscribed ulceration of the palate and tongue. African histoplasmosis is characterized by cutaneous lesions: semicircular, lenticular papules, sometimes with a depressed centre, or nodules, indolent ulcers and fistulae.

**Diagnosis** is based on fungal culture carried out by specialist laboratories and histopathology of skin lesions.

### BACTERIAL DERMATOSIS

**Cutaneous Tuberculosis** (*Mycobacterium tuberculosis*, *Mycobacterium bovis* and *Mycobacterium avium*) is an infectious disease that is now rare in the cat. However, due to the resurgence of cases of human tuberculosis, especially in severely immunosuppressed people, it is essential to be familiar with the disease in this species. Transmission is by direct contact with infected exudates (skin lesions, nasopharyngeal exudates) of affected animals or people and also by ingestion of contaminated meat or milk. Feline *Mycobacterium tuberculosis* infection is considered a "reverse" zoonosis, transmission occurring from man to cat.

**In the cat**, in addition to systemic signs (pyrexia, anorexia, weight loss, lymphadenopathy, cough and lameness) tuberculosis is characterized by indolent ulcers (single or multiple and often well circumscribed), abscesses, plaques or nodules which are sometimes very adherent to the subcutaneous tissues. The main affected areas are the head, neck and limbs.

**In the man**, skin lesions of tuberculosis take various forms: tuberculous canker (an inflammatory, nodular lesion which can ulcerate with regional lymphangitis and lymphadenopathy), *lupus vulgaris* (small chronic papules and nodules which collect in plaques, and sometimes ulcerate, on the face, neck and arms); verrucous tuberculosis (thick, indurated, proliferative plaques restricted to the hands and knees); peri-orificial tuberculosis (ulcerative lesions of the mouth, anus, vagina or urethra); military tuberculosis (numerous popular lesions associated with pulmonary military tuberculosis); and gomo tuberculoso (subcutaneous nodules which develop into ulcerated abscesses).

**Diagnosis** is based on clinical signs, cytology, histopathology and bacterial culture. Rapid acid-fast staining of needle aspirates and smears are the procedures used most frequently to confirm the diagnosis of tuberculosis. Finding acid-fast bacilli confirms the presence of mycobacteria. Biopsy, culture and post-mortem examination are the preferred diagnostic procedures.

Cats with tuberculosis must be euthanased for public health reasons. This applies equally to cats carrying *Mycobacterium tuberculosis* and *Mycobacterium bovis*, which can be the source of infection for man and other animals.

### VIRAL DERMATOSIS

**Pox Virus Infection** is a viral dermatosis caused by cowpox virus, an orthopoxvirus reported in various species, especially cats, cattle and man. The risk of transmission to man is reduced if simple hygiene precautions are taken. However, there have been reports of transmission from cat to man and such cases carry a guarded prognosis in immunosuppressed or old people. The withdrawal of the small pox vaccine has led to a reduction in protection of the whole population against poxviruses and left immunosuppressed, non-vaccinated people more susceptible to these infections.

**In the man**, the incubation period is 2-6 days. Dermatological signs associated with cowpox are usually mild and characterized by lesions that are initially papular and then vesicular and vesiculopustular, with a central depression and a surrounding halo. Lesions are restricted to the face, hands and arms. More rarely, nodules with central ulceration can be seen. Systemic signs, including pyrexia, peripheral lymphadenopathy and headache are sometimes encountered. In immunosuppressed patients, the signs are much more severe and characterized by a generalized pustular and haemorrhagic dermatosis which can sometimes be fatal.

**Diagnosis** is based on initial clinical appearance and development of the lesions. Histopathology of skin biopsies is very suggestive. The virus can be demonstrated by electron microscopy or by isolation on cell culture.

Prophylactic measures should, therefore, be taken when dealing with poxvirus infection in the cat: wearing gloves and goggles when handling affected animals; preventing the cat coming into contact with old or immunosuppressed people or young children; and, given the highly resistant nature of the virus in the external environment, cleaning and disinfecting the environment.

### PARASITIC DERMATOSIS

**Notoedric Mange** is a parasitic dermatosis caused by the mite, *Notoedres cati*. It is contracted by direct contact or sometimes by indirect contact with contaminated objects. It is highly contagious between cats and to dogs and man.

**In human beings**, notoedric mange causes transitory skin lesions characterized by vesicles, erythematous papules, urticarial plaques, crusts and excoriations in areas of contact with the cat, especially arms, legs, chest and abdomen. There is a sudden onset of severe pruritus. Lesions develop within 24 hours of contact with the affected cat and regress spontaneously within two weeks if infestation is slight and contact with the affected cat is avoided.

**Otodectic Mange** is a parasitic dermatosis caused by the mite, *Otodectes cynotis*, and contracted by direct contact with an infested cat. It is highly contagious between cats, from cats to dogs and more rarely to man. **In people**, otodectic mange causes a transitory popular dermatitis on the body, characterized by vesicles, erythematous papules, urticarial plaques, crusts and excoriations on the arms and thorax.

Pruritus is very marked. As the parasites can only survive for a few days off their host, skin lesions regress spontaneously within about two weeks.

**Cheyletiellosis** is a parasitic dermatosis caused by the mite, *Cheyletiella blakei*, and contracted mainly by direct contact with an infested cat. It is highly contagious between cats and from cat to man. **In human beings**, cheyletiellosis is characterized initially by erythematous, very pruritic macules, followed by papules on the trunk and forelimbs. Urticarial plaques, vesicles or pustules can sometimes be seen. Generalized, non-lesional pruritus may also be observed. As the life cycle is not completed on man, infestations with *Cheyletiella blakei* resolve spontaneously after affected cats have been treated.

**Flea Infestation.** The cat flea, *Ctenocephalides felis felis*, is the most common parasite of the cat. When young adults fleas emerge from their pupae, they may bite people causing hypersensitivity reactions in some individuals. Lesions occur mostly on the distal limbs (ankles and wrists) and areas of constriction by clothes (socks, belt, bra). They are characterized by very pruritic papules, sometimes urticarial plaques, vesicles and secondary excoriations.

The cat flea is also the vector (for transmission between cats) of *Bartonella henselae*, the organism that causes cat scratch disease. The cat is therefore an asymptomatic carrier of this bacteria. Transmission to man occurs mostly by bite or scratch, but sometimes indirectly by flea faeces. The typical form is characterized by the development, within 3-10 days, of a transient papular lesion at the site of the scratch. This is followed by marked regional lymphadenopathy within 2-3 weeks. Cat scratch disease is non-febrile. In 5-15% of cases, it presents atypically: pyrexia, abdominal pain, headache,

unilateral conjunctivitis, uveitis, hepatomegaly, splenomegaly and encephalitis. One particular clinical form called bacillary angiomatosis is seen in severely immunosuppressed individuals and involves a vasoproliferative syndrome with purplish-blue, fragile, haemorrhagic papules and nodules associated with severe systemic signs.

Testing for antibodies against *Bartonella henselae* is the most common method of diagnosis. Culture is very rarely positive except perhaps in bacillary angiomatosis. The most sensitive and specific diagnostic test is *in vitro* gene amplification carried out on lymph node biopsies.

With cats also giving shelter to rodent fleas, cats can also be passive vectors of *Yersinia pestis*, the plague organism.

Regular, rational flea control in cats is therefore necessary for both therapeutic and preventive purposes.

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