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NEWSLETTER

Bartonella and Skin Diseases[©]

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In This Issue:

The fall 2003 issue of the NVL Newsletter will discuss the association of *Bartonella* and skin diseases in cats and humans and a diabetes therapy alert. Human *Bartonella*-induced skin lesions often occur at the site of a scratch or bite of a cat.^{1,2} In this regard, *Bartonella clarridgeiae* was first shown to be a human pathogen when it was isolated from a veterinarian who developed a cat scratch disease skin lesion at the site of a cat scratch.^{1,3}

Bartonella and Skin Diseases

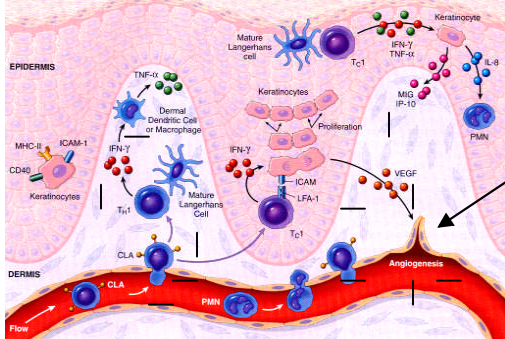
Cats:

Pathogenesis:

Bartonella stick or clump together in tissues and stick to, and penetrate, RBCs and endothelial cells. The ability to adhere to each other, and to the membranes of RBCs and endothelial cells, leads to the wide and varied tissue pathogenesis observed in cats, dogs, and people. Pili, hair-like structures found on the bacteria's surface, and a protein called deformin, are probably responsible for the sticky properties.⁴

The wide tissue tropism of *Bartonella* is due to the adhesion to endothelial cells which are the constituents of capillaries. *Bartonella* proteins stimulate endothelial cells (Figure 1) to proliferate causing neovascularization or angiogenesis. Thus, *Bartonella* induce chronic lymphocytic plasmacytic granulomatous inflammatory reactions in any tissue, including the skin.

Figure 1 *Bartonella* Skin Inflammation



Legend: The black rods (--) represent *Bartonella* in the blood, skin, or mucosa. The bacteria induce angiogenesis (arrow) and an outpouring of inflammatory cytokines which recruit inflammatory cells such as lymphocytes, plasma cells, and macrophages.

BARTONELLA-INDUCED SKIN DISEASES:

Human:

Cutaneous bacillary angiomatosis
Cutaneous rash- Henoch-Schenlein purpura
Cutaneous granuloma annulare

Feline:

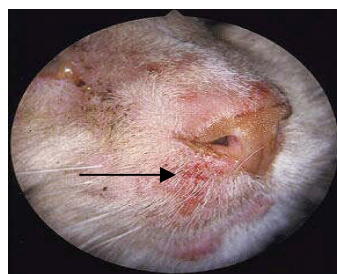
Cutaneous papules- "acne"
Cutaneous granulomas
Dermatitis- rash

The skin reactions are apparent to the cat owners and veterinarians as rashes, red raised papules "acne", and granulomas (Figures 2-9). We found 105 of 204 (52%) cats with skin conditions were infected with *Bartonella* (Table 1).⁵⁻⁷ Many of the infected cats with skin conditions also had concurrent inflammatory disease in other sites such as gingivitis, uveitis, conjunctivitis and URI.

Table 1
Bartonella-Associated Skin Diseases in Cats

Disease	# Tested	# Positive	% Positive	> X Healthy
Healthy	620	122	20%	X
Dermatitis-rash	123	63	51%	2.5X
Papules "Acne"	39	18	46%	2.3X
Granulomas	42	24	57%	2.8X
Totals	204	105	52%	2.6X

Figure 2



Chronic facial rash (dermatitis) in a *Bartonella* infected cat with chronic uveitis. The uveitis and facial skin rash resolved completely with azithromycin therapy.^{8,11}

Dr. Kerry Ketring:
All Animal Eye Clinic, Cincinnati, OH

Figure 3a Before Therapy



Chronic facial rash (dermatitis) in a cat with chronic conjunctivitis and blepharitis.

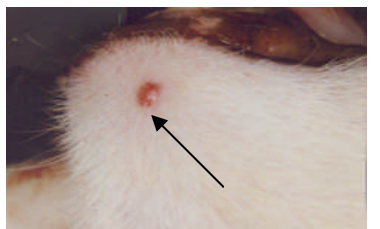
Figure 3b After Therapy



The skin rash and eye inflammation resolved completely with azithromycin therapy.⁹⁻¹¹

Dr. Jack Broadhurst,
Cat Health Clinic, Pinehurst, NC

Figure 4a Before Therapy



Chronic chin papule "acne" in a young cat who also had gingivitis and chronic URI.

Figure 4b After Therapy



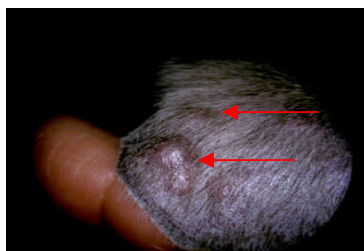
The chronic chin papule, gingivitis and URI completely resolved after azithromycin therapy.
Jan Corbishley, R.V.T.: Oradell Animal Hospital, Paramus, NJ

Figure 5 Papule



Cutaneous papule in a 6 month old kitten who also had chronic gingivitis. This lesion is similar to the papule seen, at the scratch or bite site, in many people with CSD. We isolated 1000 *Bartonella* per ml from the blood of this cat. The gingivitis and skin lesions completely resolved with azithromycin therapy.

Figure 6 Granulomas

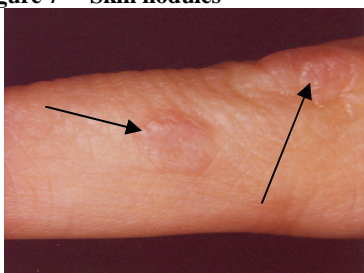


Large cutaneous granulomas in the ear of a cat with chronic uveitis. The uveitis and ear nodules completely resolved with azithromycin therapy.⁸ **Dr. Kerry Ketring:**
All Animal Eye Clinic, Cincinnati, OH

Human:

Bartonella-induced skin diseases (bacillary angiomatosis, rashes and granulomas) were first described in humans and similar conditions were then recognized in cats.¹⁻⁶

Figure 7 Skin nodules



Two raised non-erythematous papules in a veterinary technician at the site of a cat scratch that persisted for several weeks. She was positive for *Bartonella* antibody.

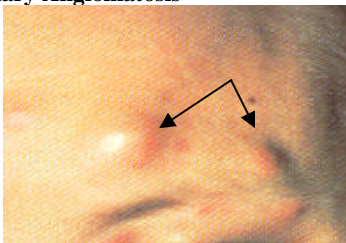
Case 1: Henoch-Schenlein Purpura

The 17-month-old son of a veterinarian developed a persistent red rash on his right forearm which resembled Henoch-Schenlein purpura, a cutaneous rash that can be caused by several bacteria, one of which is *Bartonella*. The family's cat, that had continually licked the boy's right hand, tested positive for *Bartonella*. The boy was indeterminate for *Bartonella* and the rash resolved without therapy.

Case 2: Cat Owner: Bacillary Angiomatosis

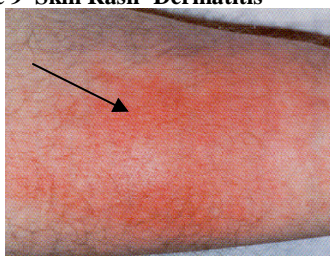
A homeless HIV-infected drug abuser presented to a NYC hospital with fever and red lumps on his face and chest after adopting a healthy 16-week-old stray kitten from the street. The kitten was heavily infested with fleas and was strongly positive for antibody to *Bartonella*. The patient was also strongly positive for *Bartonella* antibody. The skin lesions and fever completely resolved after 4 weeks of erythromycin therapy.

Figure 8 Bacillary Angiomatosis



Bacillary angiomatosis on the face of an HIV infected IV drug abuser who adopted a 16-week old *Bartonella*-infected kitten.

Figure 9 Skin Rash- Dermatitis



Erythematous dermatitis in the pre-tibial area of a *Bartonella*-infected patient.

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Bartonella references can be obtained at:
www.nlm.nih.gov/

Bartonella Therapy Alert Diabetes Mellitus

It has come to our attention, through the very astute observations of Dr. Phillip Raclyn of the Riverside Veterinary Group, New York, NY and Yorktown Animal Hospital, Yorktown Heights, NY, that azithromycin therapy of *Bartonella* infected cats with diabetes mellitus may markedly alter the requirement for insulin maintenance. Dr. Raclyn has treated two *Bartonella*-infected diabetic cats (treated for other *Bartonella*-associated diseases) with 21 days of azithromycin and noted that one cat no longer required insulin to maintain a normal blood glucose level. The second cat went into a hypoglycemic coma while being treated with azithromycin. The cat recovered and presently requires significantly less insulin for blood glucose maintenance.

We theorize that *Bartonella* may be responsible for inducing inflammation of the pancreas in some cats resulting in diabetes mellitus. Thus, when azithromycin therapy removes the *Bartonella*-infection, and resulting pancreatic inflammation, the insulin controlled glucose metabolism may return to normal in some cats. In this regard we have checked our *Bartonella* FeBart® Test records and found that 63 of 123 (51%) cats with diabetes were infected. Most of these diabetic cats were being tested for another reason, such as gingivitis, URI or another *Bartonella*-associated inflammatory disease.

Inflammation of the insulin producing tissues of the pancreas may cause malfunction resulting in inadequate insulin release and altered glucose metabolism. We would like to obtain follow-up information on azithromycin treated diabetic cats.

****RECOMMENDATION****

The blood glucose levels of *Bartonella*-infected diabetic cats, who are being maintained on insulin, should be monitored closely during azithromycin therapy. Alteration of the insulin maintenance dose may be required.