

# What's Eating You? Cat Flea (*Ctenocephalides felis*)

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Sudden onset of severe papular urticaria due to flea bites usually is associated with the ongoing or former presence of a pet in the home.<sup>1,2</sup> We describe the sudden onset of severe papular urticaria due to flea bites in a woman with no history of pet ownership who discovered a raccoon living in her chimney.

## Case Report

A 39-year-old woman developed sudden onset of severe papular urticaria with more than 40 lesions developing in 2 days. The lesions appeared in clusters of 2 to 5, with the majority of lesions around both ankles. The patient's dermatologic history was remarkable for severe reactions to insect bites and wasp stings. She had lived in her home for 6 years and had never owned a pet in that home, had not visited any homes with pets in the 2 weeks prior to the eruption, and did not work with animals. There were no signs of rodent droppings in the home. She lived in a quiet neighborhood with many trees in Indianapolis, Indiana. After her dermatologist suggested a search for fleas, the patient found several live fleas in her home.

The patient's dermatologist (H.S.G.) suggested examination of the chimney, recalling a case he had seen 30 years prior of a petless patient with papular urticaria due to a flea-infested chipmunk living in the chimney. The current patient recalled hearing noises from the chimney and hired a chimney sweep. Examination of the patient's chimney revealed a

raccoon, which was chased out. Sweeping of the chimney revealed copious amounts of loose fur, suggesting the raccoon had been living in the chimney. Examination of the roof revealed raccoon feces. Caps were placed on the chimney and furnace flues, an indoor fogger containing pyrethrins and permethrin was used in the home, and an outdoor insecticide containing bifenthrin was used around the perimeter of the home. Fleas were still seen during the following week and the patient's papular urticaria continued. Examination of all mattresses and sudden nighttime examination of the sheets were negative for bedbugs. Home flea treatment was repeated using an indoor fogger containing resmethrin one week later. Additional fleas were present after the second round of treatment. The patient purchased a vacuum cleaner with a bag, began vacuuming frequently, and sprinkled all carpets with diatomaceous earth. The patient's papular urticaria continued, and living and dead fleas continued to be found. One of the dead fleas was sent for evaluation and identified as *Ctenocephalides felis* (cat flea). Treatment was repeated for a third time with a fogger containing pyrethrins and permethrin approximately 2 weeks after the second treatment.

Over 4 weeks, the patient developed more than 150 lesions with severe itching. Oral antihistamines and high-potency topical steroids were used with some relief. The patient developed insomnia and mild anxiety, finding it difficult to sleep because she worried about getting bitten further during the night. Approximately 8 weeks after the onset of the first eruption, no other lesions appeared, but a roof leak was noted. The roof inspector saw a raccoon walking from the roof to a neighboring tree as he pulled into the driveway and found several shingles ripped off, apparently by the raccoon. The roof was patched and the tree next to the home was taken down. All air ducts in the home

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were cleaned because of concerns about residual insecticides. The estimated total cost to the patient, which included chimney sweeping, chimney and furnace cap installation, insecticide treatment, medications, a new vacuum cleaner, cleaning and dry cleaning of large amounts of clothing and bedding, roof repair, tree removal, and air duct cleaning, was more than \$2500.

### Comment

Sudden onset of papular urticaria from flea bites should prompt a search for hidden feral or domestic animals at home and at work. Although raccoons are known to carry fleas,<sup>3</sup> only 1 other report in the literature has documented transmission of fleas to humans by raccoons based on a search using Ovid MEDLINE for the terms *raccoons*, *fleas*, and *human*. In 1979, Hunter and colleagues<sup>4</sup> described the transmission of cat fleas to humans by raccoons that had moved into the space between the walls of 2 town houses in a suburb of Washington, DC. The raccoons were discovered when the faceplate to the upstairs bathroom plumbing became loose and a raccoon entered the home. The resident raccoon had babies that were seen peeping out from an outdoor vent. Approximately 7 months later the raccoon family moved out for unknown reasons. Several residents of the town house developed flea bites, as the remaining fleas from the vacant raccoon nest moved to the only remaining food source, humans. The residents collected samples of the fleas, which were identified as *C felis*.<sup>4</sup> In our case, a cat flea also was identified in the patient's home, suggesting a similar mechanism. Only one raccoon was observed in her chimney and the fleas may have started biting the woman before it was chased out because the raccoon traveled in and out of the chimney to obtain food, unlike the Hunter et al<sup>4</sup> case that reported raccoon babies in the nest.

Other reports of uninvited houseguests transmitting fleas include bird fleas spread to homes by feral pigeons nesting in the attic<sup>5</sup> and starlings nesting near a home.<sup>6</sup> Flea infestations in day cares leading to papular urticaria in children also have been reported. In one case the source was cat fleas from cats living in the crawl space beneath the center<sup>7</sup>; in another case the source was dog fleas (*Ctenocephalides canis*) from foxes living in an unused heating conduit beneath the center.<sup>8</sup>

In our case, the patient's prior severe reactions to insect bites and wasp stings may have been a predictor for developing severe papular urticaria in response to flea bites. Not all patients exposed to flea bites develop papular urticaria.<sup>7</sup> Patients who develop papular urticaria seem to have a type I hypersensitivity reaction with many T lymphocytes and macrophages noted on histopathology.<sup>9</sup>

Flea infestation is upsetting and expensive. Distress and insomnia previously have been described in association with flea infestation.<sup>5</sup> The substantial financial cost to patients has not been extensively discussed in the literature.

Treatment of papular urticaria may require some detective work on the part of the dermatologist and patient. It is likely that similar cases will present to other dermatologists at some point in their careers.

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