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FIV: Vaccination Concerns and Questions

Frito liked to eat. Living on the streets of Brooklyn, New York as a feral cat, food was a scarce commodity. Although a cautious and timid tomcat by nature, Lois Stein patiently gained Frito's trust using a few kind words...and lot of tuna! In a few short weeks, Lois, a lifelong cat lover, was able to pat him and scratch his head, distracting him with her armament of snacks and treats, which he devoured ravenously. An un-neutered male, Frito had the big jowls eventually develop in testosterone-laden tomcats, and his scarred and scabby head bore the evidence of past catfights. But underneath his gruff exterior, Frito was a housecat at heart, and it didn't take very long before Lois could lure him into a cat carrier and bring him inside.

Once captured, Lois let Frito acclimate to her one-bedroom apartment. He quickly took to sleeping on the bed, and learned to use his litter box immediately. A week later, Lois figured it was time for Frito's first trip to the vet. Frito was pronounced healthy. He was tested for the feline leukemia virus, and vaccinated against panleukopenia, the upper respiratory viruses, and rabies. He was neutered two weeks after that. Frito's veterinarian estimated his age to be between 3 and 5 years.

Frito quickly settled into a life of domestic bliss, becoming friendly, outgoing, and affectionate. He seemed to have lost all traces of his former feral life, except one: his appetite. Although food was now abundant, Frito attacked his food bowl as if each meal was his last. Gluttony notwithstanding, Frito lived on for years as a happy (if not somewhat beefy) companion. So, when Frito stopped eating last week, Lois knew something was amiss.

"He was interested in the food, but he wouldn't eat it. He'd try, but the pieces would fall out of his mouth. He'd only eat canned food, and even then, it was obvious something was bothering him".

As a veterinarian specializing in cats, I had seen countless cases of cats that have stopped eating. But this was different. Frito wanted to eat, but couldn't. This usually indicates an oral problem.

On physical exam, Frito was friendly and cooperative. Oral examination revealed several abnormalities, most notably a large ulcer in the center of his tongue, and a smaller one on the tip. Frito also had significant dental tartar and gingivitis. Assured that he could not have ingested a caustic substance, I probed a bit further. I asked about his feline leukemia (FeLV) and feline immunodeficiency virus (FIV) status. FIV is known to cause oral problems in cats, especially oral ulcers. Lois showed me Frito's medical records. I saw that his original veterinarian had tested him for FeLV five years previously, but there was no record of an FIV test. Knowing that this virus is transmitted by bite wounds, and seeing all of Frito's battle scars, I feared the worst. Obtaining blood for a combination FeLV/FIV test, I ran the test immediately.

Eight minutes later, I had sad news to report: Frito tested positive for FIV. Lois was distraught, and she peppered me with questions. "Why wasn't he tested when I found him years ago?! How could I have prevented this?!" Lois grew quiet. "So... what do we do now?" she sighed.

The feline immunodeficiency virus was isolated by Dr. Neils Pedersen and Dr. Janet Yamamoto in 1986 from a cat with clinical symptoms that were strikingly similar to those seen in humans with acquired immunodeficiency syndrome (AIDS), the disease associated with human immunodeficiency virus (HIV) infection. FIV and HIV are classified as retroviruses. They contain RNA as their genetic material. Once the virus invades the host's cells, it uses the cell's own machinery to make a DNA copy of its genome. The viral DNA is then incorporated into the host's own genome, where it serves as a template to reproduce thousands of copies of itself. Despite the similarities to the human immunodeficiency virus, FIV cannot be transmitted to humans.

Fighting is the primary mode of viral transmission. The virus is present in saliva, and infected cats can transmit the virus by biting other cats. As free-roaming, intact male cats are more likely to engage in fighting behavior, the disease has the highest prevalence in this population of cats. Frito, having lived out doors and bearing the scars of numerous catfights, was a textbook case.

FIV infection can be divided into three stages: acute infection, lasting 3 to 6 months; subclinical infection, lasting months to years; and feline AIDS or chronic clinical disease, which may also last months or years. Cats in the first (acute) stage of infection experience mild disease (fever, lymph node enlargement, intermittent lethargy and decreased appetite). Most cats recover on their own, and are rarely presented for veterinary care in this stage. During the subclinical stage, cats remain clinically healthy, although their immune function continues to deteriorate, as the virus causes a continuous decline in CD4+ cells – white blood cells important for proper immune function. As their CD4+ cells reach very low levels, the third stage of disease develops, and cats show signs of their illness. These cats are susceptible to a wide variety of opportunistic diseases. (See Sidebar One). Oral problems are a common manifestation of FIV infection. Other common diseases seen in FIV infection include recurrent upper respiratory infections, chronic gastrointestinal disorders, and chronic skin disorders. Frito presented in this later stage of FIV infection.

The American Association of Feline Practitioners and the Academy of Feline Medicine regularly publishes guidelines for feline retrovirus testing and management. In their latest report, they once again recommended testing all cats for FIV, especially under certain circumstances.

Once a diagnosis is made, several steps should be taken. No test is 100% accurate at all times and under all conditions. Positive test results, especially in cats with no symptoms, should be confirmed with a test known as a Western Blot test. A diagnosis of FIV is not necessarily an automatic death sentence. Cats can live a healthy, normal life for years before symptoms of disease become apparent. Other cats in the household are theoretically at risk, however, the virus is transmitted by bite wounds. Casual contact (mutual grooming, sharing of food bowls, water bowls, and litter boxes) does not transmit the disease. As most cats in a multiple-cat household live together peacefully, transmission to the other cats is not very likely.

Dr. Anne Sinclair, president and CEO of Cat Sense Feline Hospital and Boarding, Inc. in Bel Air, Maryland, agrees. "I've been examining six cats in a multiple cat household, two of which are FIV positive", she says. "I've been testing all six cats every year. The FIV status has remained the same for the past eight years now". Cats with FIV should remain indoors permanently, to prevent spread to other cats, as well as to limit their exposure to infectious agents carried by other animals. Owners of FIV-infected cats need to be vigilant, and should bring their cat to the veterinarian at the first sign that something might be amiss. Early recognition and aggressive treatment is important in the care of these cats. Semi-annual wellness visits are a must.

Treatment of the viral infection itself is somewhat limited. Therapy for retroviruses has focused on inhibiting reverse transcriptase, the enzyme that catalyzes the production of viral DNA. Therapy with drugs that have been used to treat HIV, such as AZT (azothiouridine) has been attempted in cats, with mixed results. Anti-retroviral drugs seem most effective when given early in the course of disease. This is a problem, since the acute stage of disease tends to be missed by most cat owners. To date, there is no treatment that has been shown to reverse well-established FIV infections in cats. Given this fact, the care of FIV-infected cats is mainly supportive. Fortunately, many cats infected with FIV respond as well as their uninfected counterparts to appropriate medications and treatments, although a longer or more aggressive course of treatment is often needed. Infectious conditions require antimicrobial therapy. Inflammatory conditions may require therapy with systemic anti-inflammatory drugs, such as corticosteroids.

In terms of disease prevention, for years the only truly effective advice we could give our clients was to have owners keep their FIV-negative cats indoors where they could not encounter infected cats. Cats that do go outdoors should be spayed and neutered, to limit the spread of FIV by decreasing fighting and roaming behavior. Recently, however, a major scientific breakthrough may significantly change the way we prevent FIV infection.

In 2004, the U.S. Department of Agriculture approved the first vaccine against FIV. The vaccine has been licensed to Fort Dodge Animal Health, of Overland, Kansas. Dr. Janet Yamamoto, Professor of Pathobiology at the University of Florida in Gainesville, worked with researchers at Fort Dodge Animal Health for more than a decade to develop the vaccine. "The vaccine offers the first effective protection for cats against this often fatal disease", says Neils Pedersen, co-discoverer of the virus and Professor and Director of the Center for Companion Animal Health at the University of California at Davis. Cats determined to be at risk for the disease will initially require a series of three vaccines, given approximately three weeks apart, to achieve immunity. Annual boosters are recommended thereafter. Dr. Steve Connell, Director of Professional Services at Fort Dodge Animal Health, says that no major side effects or adverse reactions were seen in the safety study, in which 600 cats were vaccinated. There is some concern about the vaccine's effectiveness, however. In a study of the vaccine's efficacy, 67% of cats vaccinated against FIV were protected from infection when exposed to the virus. In comparison, of 100 non-vaccinated cats exposed to FIV, 76% contracted the disease. This calculates out to a 55% "positive predictive value". The positive predictive value is a better reflection of a vaccine's true effectiveness, and a 55% protection is considered to be somewhat low. (Rabies vaccination, in comparison, approaches nearly 100% protection). Another concern centers around future FIV testing. The current FIV test

is designed to detect antibodies against the virus. Cats vaccinated against FIV will develop antibodies against the virus. It may not be possible to determine, in vaccinated cats who might develop symptoms of FIV infection months or years later, whether the antibodies in their bloodstream developed in response to previous vaccination, or in response to natural infection. "We feel the benefits outweigh the negatives in terms of testing." He continues, "Similar concerns were expressed when the Lyme disease vaccine was initially introduced. Soon after, however, the Western Blot test was shown to be able to distinguish whether antibodies were due to vaccination vs. infection. We feel confident that the testing issue will be a non-issue". "Fort Dodge strongly urges all clients to have their cats tested before considering vaccination, because cats already carrying the virus will not benefit at all from vaccination."

Dr. Jack Bregman, owner of two feline-exclusive veterinary hospitals in New York, is elated with the new vaccine. "I examine hundreds of cats every year. I diagnose a case of FIV at least once a month, and I euthanize more sick FIV-positive cats than I care to think about. I hope the vaccine reduces the incidence in the same way the feline leukemia virus vaccine did when it hit the market several years ago." The development of the vaccine is significant in another aspect as well: FIV has been studied extensively because researchers feel that it serves as a useful animal model for the study of HIV in humans. The development of a vaccine against FIV fuels the hope that a human vaccine is possible.

Frito is doing well now. A brief course of antibiotics to prevent secondary oral bacterial infection, and two weeks of a liquefied diet has caused his oral ulcers to heal. "He's started crunching on his dry food again," says Lois, relieved. "I hope to keep Frito around for a long time".

Organ systems commonly affected by FIV :

- Oral Cavity: dental and gum disease, lingual (tongue) ulcers
- Lymph nodes: enlargement is commonly seen
- Eyes: eye infections and retinal disorders
- Skin: external parasites, as well as fungal infections, such as ringworm, commonly develop
- Body weight: should be accurately measured and recorded, because weight loss is often the first sign of deterioration in a cat's condition

FIV testing guidelines, as recommended by the American Association of Feline Practitioners and the Academy of Feline Medicine. All cats should be tested for FIV in the following circumstances:

- when cats are sick, regardless of previous negative test results
- when cats and kittens, regardless of age, are newly adopted, whether or not they will be entering a household with other cats
- when cats live in households containing cats with unknown FIV infection status
- when cats have had potential exposure, such as a bite inflicted by a cat of unknown infection status. Such cats should be tested a minimum of 60 days post-exposure
- every year, if cats are at high risk of infection (high risk = cats that fight, or those that live with infected cats)