



VACCINE-ASSOCIATED SARCOMAS IN CATS

A vaccine-associated sarcoma is a connective tissue cancer that occurs where a vaccine has previously been given. Vaccine-induced sarcoma is a rare consequence of vaccination in cats. It does not occur in dogs. This disease was first recognized in the late 1980s and early 1990s. During this time, many new feline vaccines were developed, and vaccination of cats became more common. The goal of these vaccinations was to improve the health of cats. At the same time however, veterinary pathologists began to notice an alarming frequency of sarcomas in locations where vaccines are generally given to cats: between the shoulder blades, on the back legs, and over the back.

Studies were done to determine the cause of this phenomenon. They showed that the majority of cats do not get cancer from vaccination. Between 1 in 1,000 to 1 in 10,000 cats develop a tumor at a vaccination site. The tumors were found to occur more commonly with vaccines for rabies and feline leukemia virus but the brand of vaccine did not make a difference. The risk was over twice as high when two or more vaccines were given in the same location. Finally, there was no way to predict which cats would develop cancer at a vaccination site.

The exact cause of cancer arising from vaccination remains a mystery. A vaccine normally works by causing irritation or inflammation at the vaccination site. One theory is that in the rare individual cat, normal cells at the vaccination site divide abnormally and mutate. A cell that undergoes a sequence of many mutations may divide uncontrollably and ultimately become cancerous.

Vaccine-associated sarcomas in cats are very aggressive tumors. They may develop as soon as two months following a vaccination or as long as three to four years later. The tumors grow outward and deep into muscles and fat. They develop long "fingers" of cancer cells extending as far as one inch beyond the visible edge of the mass. These fingers of cancer cannot be seen with the naked eye during surgery, only under the microscope. After a sarcoma is cut away, it will grow unless every single cancer cell is removed, including the microscopic fingers around the mass.

TREATMENT

Surgery: Vaccine-induced sarcomas can be cured with surgery only if found and treated while they are still small. The surgery involves removing enough skin and muscle to ensure that every cancer cell is eliminated. When the tumor occurs on the leg, the leg must be amputated. Fortunately, three-legged cats have a normal lifespan with normal activity if the cancer has been detected early.

LOS ANGELES
(310) 558-6120

ORANGE COUNTY
(949) 552-8274

SAN FERNANDO VALLEY
(818) 888-6882

SOUTH BAY
(310) 693-5890

Radiation Therapy: Sometimes the vaccine-induced sarcoma is not recognized until it is large, and some tumors occur in a location where aggressive surgery is difficult. Radiation therapy can be combined with surgery at the tumor location to help add years of life expectancy. Radiation therapy may be given either before or after the surgery to remove the visible portion of the tumor. Temporary skin irritation and hair loss around the tumor site are common. These side effects are temporary and most cats fully recover from any skin irritation within two to four weeks. Precise computerized planning using a CT scan limits the potential for damage to internal organs.

Chemotherapy: Vaccine-induced sarcomas may slow or stop growing when chemotherapy medications are given, but the drugs cannot cure this type of cancer. Side effects depend on which medications are used, but 95% of cats have no significant side effects.

PROGNOSIS

Veterinarians and cat owners must work as a team to fight vaccine-induced sarcomas. To prevent sarcomas, veterinarians give each vaccine at a separate location on the body when multiple vaccines are needed. To help ensure that successful treatment will be possible, veterinarians give the vaccines associated with sarcomas in the back legs. Should a cat be extremely unlucky and develop a tumor, the cancer can be completely removed by amputation.

The most important factor leading to successful treatment is early detection: find a tumor when it is very small. If a firm lump remains in a vaccination site longer than one month after the vaccine is given, a veterinarian should examine the cat. Vaccine location and early detection may prevent cats from dying of a vaccine-induced sarcoma, while making sure that important infectious diseases can still be prevented by vaccination.

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