

Vaccine-Associated Sarcomas in Cats

- Vaccine-associated sarcomas are cancerous tumors that occur at vaccination sites in cats.
- Approximately 1 to 2 out of every 10,000 vaccinated cats develop this condition.
- Your cat should be seen by a veterinarian if you notice swelling at the vaccination site that grows larger after 1 month, is bigger than 2 cm (0.79 inches), or persists for more than 3 months.
- Diagnosis is made via a surgical biopsy (tissue sample).
- Treatment requires wide surgical excision (removal), often followed by radiation or chemotherapy.
- Because the risks of contracting a serious infectious disease are greater than the risks of developing a tumor, it's generally recommended to keep cats current on vaccines.
- You should discuss the risks and benefits of vaccination with your veterinarian.

What Is a Vaccine-Associated Sarcoma?

Cats can develop cancerous tumors called *fibrosarcomas*, or *sarcomas*, at the locations where they have been vaccinated. These aggressive tumors can appear just months after vaccination, or many years after the fact.

While these tumors are very serious, they are not very common. It's estimated that approximately 1 to 2 out of every 10,000 vaccinated cats develop this condition.

What Causes These Sarcomas?

Vaccines help protect cats from dangerous infectious viruses by stimulating an immune response (forming antibodies) against the virus. Vaccines generally contain very tiny amounts of the target virus, or protein particles derived from the virus. When this material is introduced into the body in a vaccine, the body's immune system responds through a series of steps that include making antibodies and modifying other cells that will recognize the target

organism later. These changes constitute an immune response. When the vaccinated individual encounters the "real" organism later, the body recognizes the organism and reacts to protect the vaccinated individual from becoming sick.

Live viruses can create an immune response, but they also have the potential to infect the animal. To prevent this, the viruses in vaccines are modified or killed to make the vaccines safer. In

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many cases, killed viruses cannot stimulate an immune response as effectively as modified or live viruses. A substance called an *adjuvant* is added to these vaccines to help the animal mount a more effective immune response over a longer period of time.

While no one is exactly sure what causes vaccine-associated sarcomas, it has been suggested that the adjuvant, combined with local inflammation, may be a contributing factor. Although these tumors have not been linked to a single brand of vaccines, they are more commonly associated with feline leukemia virus (FeLV) and rabies vaccines.

What Are the Signs of a Vaccine-Associated Sarcoma?

If your cat develops a swelling in the skin after a vaccination, don't panic. Some vaccines can cause a mild reaction, which usually resolves in a few weeks.

Common Conditions

However, you should monitor the area and bring your cat to the veterinarian if the swelling:

- is growing in size 1 month after vaccination
- is greater than 2 cm (or 0.79 inches) in diameter
- persists longer than 3 months

Vaccine-associated sarcomas can be locally aggressive (meaning they can start just under the skin but quickly invade deeper structures, like muscle) and grow relatively fast. They can metastasize (spread) to other locations in the body, such as the lungs. Over time, the tumors can become large, unmovable, and ulcerated.

How Are These Sarcomas Diagnosed?

The best way to diagnose these tumors is by obtaining a surgical biopsy (tissue sample) and submitting it to a laboratory for analysis. At the same time, your veterinarian may recommend radiographs (x-rays) to determine if other areas of the body are affected.

How Are Vaccine-Associated Sarcomas Treated?

These tumors must be removed surgically, while your cat is under anesthesia. Before surgery, it may be necessary for your cat to undergo a computed tomography (CT) scan to help the surgeon determine how much tissue to remove. It is extremely important that the entire tumor is removed, or it may return in a more aggressive form.

Surgical removal is often followed with radiation therapy to eliminate any microscopic cancerous cells that may still be in the tissues. Some cats may require chemotherapy as well.

Should I Stop Vaccinating My Cat?

The chance of your cat contracting a serious disease is much higher than the chance of your cat developing a vaccine-associated sarcoma. So it's generally recommended to keep vaccines current.

At the same time, veterinarians are taking every precaution to help reduce the risks associated with vaccines, including:

- **Eliminating unnecessary vaccines:** If your cat is indoor only and is never exposed to other cats, it may not be necessary for your cat to receive certain vaccines.
- **Reducing the number of vaccines given in a single location:** Multiple vaccines in one location may induce inflammation, so different vaccines are generally given in different areas of the body. There are standardized locations where each vaccine should be given that help veterinarians determine which vaccines are more likely to produce a problem.
- **Injecting vaccines in the limbs:** In the past, vaccines were commonly given between the shoulder blades. However, tumors that occur there are difficult to remove. If an aggressive tumor develops in a limb, complete removal (which may include amputation of the leg) is more likely, which can save the life of a cat.
- **Extending the interval between vaccinations:** Some vaccines are available that last for up to 3 years, eliminating the need for annual vaccination.

It's a good idea to discuss the risks and benefits of vaccination with your veterinarian to determine which vaccines are right for your cat.