



**Veterinary Emergency  
+ Referral Center**  
of Hawaii

**Ettinger: Textbook of  
Veterinary Internal Medicine, 7th Edition  
Vaccine-Associated Sarcomas in Cats  
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**What is Vaccine-Associated Sarcoma?**

Vaccine associated sarcomas are soft-tissue tumors that can occur in cats at site of previous vaccination. Originally it was thought that FeLV and rabies vaccines were linked primarily to the development of sarcomas at vaccine sites in 1/10,000 or as frequently as 1/1,000 vaccines administered. More recent reports have not linked specific vaccines to the development of sarcomas in cats.

Vaccination of cats for infectious diseases is important as part of preventive health maintenance but the judicious use of vaccines and close monitoring of vaccine sites is equally important. Local inflammation from a number of different causes (suture, other injections, etc.) may also rarely result in the development of a sarcoma at the site of inflammation.

**What are the symptoms of Vaccine-Associated Sarcoma?**

Vaccine-associated sarcomas are aggressive tumors that have fingerlike projections that extend into the surrounding normal tissues in affected cats and can spread to distant sites in as many as 20% to 25% of these cats. Early recognition and intervention is the key to controlling vaccine-associated sarcomas.

Most affected cats will have a non-painful lump or bump that can be felt under the skin. A lump felt at the site of a previous vaccination is worrisome and your cat should be taken to a veterinarian.

**What tests are needed?**

The most important step in assessing a "new" lump is a biopsy. A small incision is made into the mass and a piece of it is then taken and submitted to a specialist. This specialist will examine the specimen under a microscope to determine the exact diagnosis. Once a diagnosis of vaccine-associated sarcoma has been made, then other diagnostic tests will need to be performed and the various treatment options can be discussed.

If biopsy determines that the lump of mass is a vaccine-associated sarcoma, additional evaluation may include the following:

- **Complete blood work** (complete blood cell count, chemistry panel, urinalysis) to determine overall health status
- **Chest x-rays** to evaluate for any evidence of spread to the tumor to the lung
- **Imaging of the mass**, preferably with computed tomography (CT) or magnetic resonance imaging (MRI). Imaging of the mass allows more exact delineation of the extent of the tumor and helps to determine the appropriate course of action
- **CT scans** can be used for radiation treatment planning, should that be necessary

**What treatment is needed?**

A relatively small tumor can potentially be controlled with surgery alone but it still requires "aggressive" surgery. For instance, vaccine-associated sarcomas that arise on a limb may require amputation for local

tumor control. The median survival time with surgery alone has been reported to be approximately 19 months.

If surgery alone is not likely to be successful, then other treatment options may be recommended in conjunction with surgery. Tumors that have been incompletely removed surgically have been observed to recur in that same area as soon as 2 weeks after surgery but may take as long as 6 months or more.

At the time of surgery the entire tissue that has been removed must be submitted to a pathologist. The pathologist then determines, once again, the kind of tumor that your cat has and whether or not your veterinarian has been successful in removing the entire tumor. Removal of all tumor cells is difficult and failure to do so indicates the invasive nature of these tumors and is not a reflection of the surgeon's skill.

A second surgery may be necessary if it is determined that tumor cells are still left behind after the first surgery. The most aggressive course of treatment recommended is a combination of surgery and oral or injectable radiation therapy for the tumor that an owner can feel. In addition, chemotherapy may be recommended because of the risk of metastasis and spread to distant sites in the body. Veterinarian opinions may differ regarding the recommended course of treatment and whether radiation is done prior to or after surgery.

If radiation therapy not be feasible, other options are available. For instance, it has been shown that the addition of chemotherapy after incomplete surgical resection of a vaccine-associated sarcoma may prolong survival and significantly delay local recurrence.

Of utmost importance is that a coordinated effort be made on behalf of cats with vaccine-associated sarcomas such that the surgical, medical, and radiation oncologist are in agreement as to the appropriate planned course of treatment. The involvement of an oncology team is important and should occur early in the treatment of cats with vaccine-associated sarcomas.