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ADJUVANTS & FELINE VACCINE-ASSOCIATED SARCOMA – MYTH OR REALITY???

Vaccination has generally been considered to be a benign procedure in veterinary medicine. Unfortunately, soft tissue sarcoma development subsequent to vaccination (vaccine-associated sarcoma; VAS) in cats has dramatically changed this view within our profession over the last 25 years.

The vaccines generally associated with this disease to date have been the adjuvanted rabies and feline leukemia virus vaccines, however, association with non-adjuvanted FVRC-P vaccines have been occasionally reported. The potential role of inflammation as a necessary antecedent to the development of this disease has been previously published and seems highly plausible based on the aforementioned association with adjuvanted vaccinations. Newer non-adjuvanted vaccines are likely a step in the right direction for the prevention of this disease, and we eagerly await longer-term results on the incidence of tumors with these vaccines. In 2012 the most damning evidence for an association of the development of these tumors with the use of adjuvanted vaccines was published by Phil Kass and his team from UC-Davis. This paper will be discussed at the lecture based on its important findings.

Currently, VAFSTF (Vaccine-Associated fibrosarcoma Task Force, before sunsetting) in concert with the AVMA and AAFP recommend that: 1) use of vaccines packaged in single-dose vials is strongly encouraged, 2) occurrences of VAS or other adverse reactions be reported to the vaccine manufacturer (the United States Pharmacopoeia no longer accepts these reports), 3) vaccination protocols be standardized within practices so that location, type, manufacturer and serial number is entered into the permanent medical record, 4) vaccines limited to panleukopenia, herpesvirus and calicivirus should be administered on the right shoulder, 5) rabies vaccines should be administered as distally as possible on the right rear limb, preferably below the knee, 6) feline leukemia virus vaccines should be administered as distally as possible on the left rear limb, preferably below the knee, 7) injection sites of ALL other medications be recorded in the permanent medical record and 8) vaccines should not be administered cold.

If you suspect you are dealing with a VAS in a cat, the appropriate staging diagnostics should include full physical examination, bloodwork/urinalysis, retroviral testing and 3-view chest radiographs. Retroviral testing is recommended to ensure that FeLV is not acting as a helper virus for the production of a feline sarcoma virus-associated sarcoma. Radiography for the evaluation of metastasis is performed since it appears that approximately 5% of cats with VAS have metastasis at presentation, whereas approximately 25-30% have metastasis at necropsy. Confirmation of the suspected diagnosis should be performed by obtaining an incisional biopsy with a Tru-Cut biopsy instrument (or similar incisional biopsy instrument), or small wedge biopsy. The tumor should NOT be removed until a complete diagnosis is made and a consultation with an oncologist or surgeon has been performed.

Recent studies document that RADICAL first excision of VAS is essential for an extended period of time without recurrence. In addition, recent studies also document that the practice of vaccination of the distal portions of the limbs for rabies and/or FeLV vaccinations appears appropriate since patients with VAS of the distal limbs can undergo radical surgical extirpation via amputation which appears to allow for longer survival. Unfortunately, even with aggressive surgery alone in non-distal limb locations, relatively few cats with VAS were thought to be cured. A recent study utilizing radical 5-cm margin exenterations by Kuntz et al suggests that recurrence rates can be greatly reduced and lengthy local tumor controls are possible. Due to poor cure rates with minimally aggressive surgery alone, the additional use of adjuvant radiation therapy and/or chemotherapy has been under investigation at multiple veterinary cancer centers for the last few years. It is presently unknown whether it is better to perform radiation therapy prior to non-radical surgery, or perform surgery and then post-operative radiation therapy. However, the combination of non-radical surgery and radiation therapy in studies appears to have a median survival time of 600-800 days, suggesting that additional therapies is worthwhile in the treatment of this disease when the aforementioned radical extirpation is not possible. Similarly, the use of chemotherapy has been reported by multiple investigators to have efficacy against gross feline VAS. When given to cats with grossly palpable VAS, carboplatin or a combination of doxorubicin and cyclophosphamide resulted in a 50-60% response rate. Feline non-VAS would be expected to have a 5-10% response rate to these forms of

chemotherapy, thereby suggesting that feline VAS is a remarkably different tumor than non-VAS. The use of radical surgery, radiation therapy and chemotherapy as tri-modality therapy in feline VAS is likely the best form of therapy for cats with VAS (> 3 yr median survival time for VAS cats treated with tri-modality therapy).
Through the support of VAFSTF, there have been a number of research studies which have been completed throughout the country to elucidate the etiopathogenesis, epidemiology, treatment and prevention of this disease (reader is referred to www.avma.org and the VAFSTF link). Unfortunately, the AVMA pulled its continued funding of VAFSTF which precipitated its sunsetting in 2005, even though we continue to see many cases of VAS. It is easy to see that even with aggressive therapies, we many times lose the battle against this remarkable tumor. The key to this disease is a better understanding of what causes this tumor, so that we may determine ways to vaccinate our feline friends without inducing extremely malignant tumors.

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