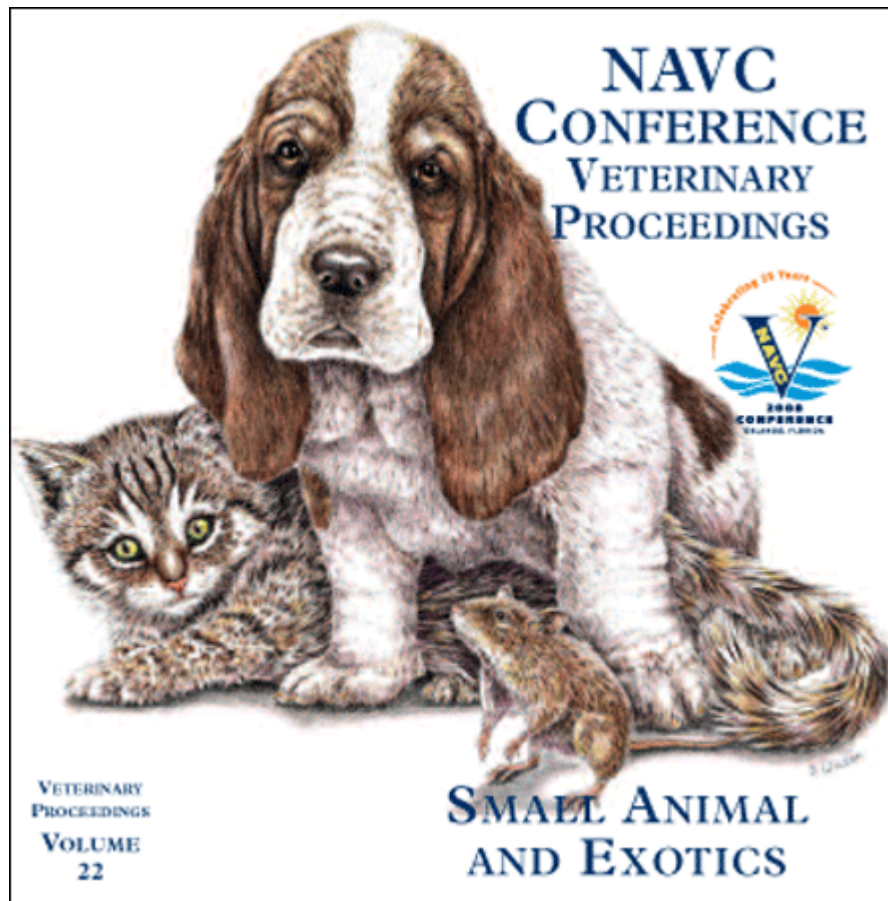


Proceeding of the NAVC
North American Veterinary Conference
Jan. 19-23, 2008, Orlando, Florida



www.tnavc.org

COMMON ERRORS IN THE MANAGEMENT OF DOGS AND CATS WITH CANCER

Glenna E. Mauldin, DVM, MS
Diplomate ACVIM (Oncology) & ACVN
Cancer Centre for Animals
Western Veterinary Specialist Centre
Calgary, Alberta, Canada

Neoplastic disease is common in pet dogs and cats. Improved veterinary care and nutrition, among other factors, have resulted in an increasingly geriatric pet population, and cancer is a major cause of death in these animals. There is no doubt that the management of dogs and cats with cancer can be challenging, but it is now an integral part of routine veterinary practice. Fortunately, it turns out that most cancers in dogs and cats are very treatable, even though they may ultimately be incurable. The last 20 years have seen exponential growth in the field of veterinary oncology, and the wide availability of sophisticated therapies has resulted in excellent quality of life and survival times that are no different from those seen with other chronic diseases for many affected animals. The expectations of pet owners have changed as well. They feel greater acceptance of the strong emotional attachment that they have to their pets, and they will do everything within their power to preserve this bond. Easy access to information through the internet and lay press also means these people are often very well informed, and they know about recent advances in both human and veterinary oncology and are committed to taking advantage of them for their animals. Veterinarians need to be knowledgeable about common cancers in dogs and cats and the options for treating them, and they need to be able to convey this information in an understandable and positive way to pet owners. This article outlines some of the most common errors made by veterinarians managing these cases on a day to day basis, and make recommendations on how they can be avoided.

MAKING ASSUMPTIONS ABOUT THE OWNER

Veterinarians often make two risky assumptions with respect to the owner of a dog or cat with cancer. First, they make a conclusion or value judgment about the course of action the owner will or should take in diagnosing and treating their animal. Second, they assume they know how much money the owner has and is willing to spend on their animal. Unfortunately, if the veterinarian is incorrect in either assumption this can have lasting and damaging effects on their relationship with the client. When advising the owner of a dog or cat with cancer, it is understandably difficult to separate your personal feelings about what is best, what is fair, or what you might do yourself given a similar situation, from what is best for that individual client and their animal. To a much greater degree than most diseases that veterinarians deal with, there are likely to be biases and emotions about cancer and its treatment that arise from personal beliefs and experiences. Despite this, it is absolutely essential to remember that the "best" course

of action for an individual owner and their animal with cancer is highly variable, impossible to predict, and an intensely personal decision. The veterinarian's job is not to tell the client what is right, it is to present all of the options in a clear, objective and understandable way and then allow the owner to choose the one that fits best for them. Some owners will go much further than we may think is reasonable, but it is their animal and this is their prerogative. Just as frustrating are the owners that give up immediately, when their pet has treatable or even curable disease. Again, though, it is their animal and this is their privilege, not ours.

A related and equally dangerous assumption to make about an owner is how much money they are going to spend. Just because an owner is wealthy does not mean they want to— or should— spend thousands of dollars treating their pet for cancer. Alternatively, just because an owner has limited financial resources does not mean they will not find some way to pay for a very expensive, complicated course of therapy. Once again, the best course of action for the veterinarian is to simply present the options in the most objective way possible, with as accurate an estimate of the associated costs as is feasible. Assuming ahead of time what any owner will do or spend can result in a very uncomfortable and negative interaction that eventually ends with the loss of the client.

CATS ARE JUST LIKE DOGS, RIGHT?

Probably the most important thing to remember about cats with cancer is that they are not dogs. Most veterinary studies that have examined tumor biology and response to anticancer therapy have been conducted in the dog. However, direct application of this knowledge to the cat should be undertaken with great care, if at all: critical differences between the two species exist. First, the biologic behavior of common tumors differs considerably. For example, mammary tumors in the dog are histologically heterogeneous but tend to have a favorable prognosis: 3 out of 4 dogs will have extended disease-free survival after surgery alone. In contrast, mammary cancer in the cat is a very homogeneous but highly malignant disease. Almost all cats have mammary carcinomas, and even if the primary tumor is resected metastasis is highly likely and survival times are relatively short. Another important difference between the two species is that response to treatment can vary widely. For instance, dogs with lymphoma that are treated with CHOP-based chemotherapy have an 80% to 90% chance of achieving a complete clinical remission, with an expected median survival time of 12 to 14 months. Their feline counterparts that receive CHOP-based chemotherapy, on the other hand, have only a 60% likelihood of complete remission and a much shorter median survival time of 7 to 9 months. Finally, expected treatment-related toxicities can be distinctly different between cats and dogs. Doxorubicin is arguably the single most effective drug included in the CHOP protocols used to treat lymphoma. However, even though it causes a distinctive and life-threatening dilated cardiomyopathy in the dog, this complication is rare in

the cat. Nephrotoxicity is a much more serious concern in this species. Veterinarians may be more comfortable with their knowledge base in canine oncology, and this is understandable based on the emphasis that has existed in the veterinary literature. However, they should always consider the possibility that what they know to be true in a dog may in fact be almost the complete opposite in a cat.

SYSTEMIC THERAPY FOR LOCAL DISEASE??

One of the most basic principles of cancer therapy is to match the treatment with the biologic behavior of the disease. Cancers can be divided into two large categories based on their biologic behavior: local and systemic. Localized cancers may aggressively invade surrounding normal tissues, but they tend to be either late to metastasize, or do not metastasize at all. Examples of typical local tumors include soft tissue sarcomas, and most mast cell tumors in the dog. These tumors are best treated with aggressive local therapy: almost always surgery, and often radiotherapy as well. On the other hand, systemic tumors either involve multiple anatomic sites at the time of presentation (canine lymphoma), or metastasize widely and aggressively during the course of the disease (canine osteosarcoma). Surgery and radiotherapy are not effective by themselves in this setting, and the only way to address all known and unknown sites of disease is with systemic therapy, or chemotherapy.

The “local therapy for local disease, systemic therapy for systemic disease” rule applies in virtually all cases. Inadequate or unsuitable treatment recommendations can be avoided by carefully researching the expected course of disease before suggesting a particular course of therapy. It is not logical to restrict treatment to aggressive and complicated local therapy in an animal that is ultimately going to die of metastasis. For instance, it would be a waste of time and money to perform a complicated limb-sparing procedure in a dog with osteosarcoma without also administering chemotherapy to treat metastatic disease. That does not mean that aggressive local therapy is unreasonable, it just means that all aspects of the biologic behavior of the tumor have to be considered when designing a comprehensive course of therapy. Conversely, it does not make sense to expose the entire animal to potential toxicity using systemic treatment when local therapy would be more effective. One of the best and most commonly encountered examples of this is the dog with a localized mast cell tumor that is given systemic corticosteroids or other chemotherapy after an incomplete surgical resection. Recent studies looking at outcome in dogs with grade II mast cell tumors indicate that over 80% of them will enjoy years of complete disease control after surgery alone: clear evidence supporting the fact that this is usually a local disease. The most appropriate course of action after incomplete surgical resection of localized mast cell tumor is more surgery or perhaps radiotherapy, not chemotherapy.

PITFALLS OF CYTOPATHOLOGY

There is no doubt that the practice of veterinary oncology would be absolutely impossible without the contribution of clinical pathologists. However, a common error made by veterinarians managing dogs and cats with cancer is to interpret the results of fine needle aspirates too literally or narrowly. There are several clear advantages of performing fine needle aspiration cytology in dogs and cats with cancer: samples can be quickly and easily obtained, using minimally invasive techniques; valuable information is generally available within a matter of hours to a couple of days at most; and, the procedure is very affordable. Despite these largely practical advantages, however, fine needle aspirates also have some disadvantages. For one thing, the sample obtained is very small and may not be representative of the entire lesion. Samples collected too far into the periphery of the lesion may consist largely of reactive host tissues; samples taken in the center of a lesion may only contain necrotic debris. In some cases the underlying neoplastic lesion is obscured by inflammation or hemorrhage. Some tumors do not exfoliate well, providing the clinical pathologist with very little material on which to base their assessment. Finally, cellular context and microscopic structure cannot be evaluated on cytology as they are with histopathology, making the diagnosis obtained less reliable. For all these reasons, clinicians should be careful not to over interpret cytopathology results. The pathologist will always do their best to provide as precise an assessment as possible, but their ability to provide useful information is limited by the quality of the material they receive. It is the veterinarian's job to know that the bottom line diagnosis printed on the cytology report is not always going to be correct, and why. Histopathology should still be the gold standard for diagnosis in most cases, especially when a very expensive course of therapy or euthanasia is being considered.

FAILURE TO ASSESS SURGICAL MARGINS

Another error sometimes made in the management of small animal cancer patients is failure to adequately assess surgical margins. When treating locally invasive cancers such as mast cell tumor with surgery, it is absolutely essential that margins be evaluated as carefully as possible. Without this information, there is no way to objectively determine whether further surgery is needed, or whether radiotherapy might be indicated. It is also impossible to provide the client with a reliable estimation prognosis. All lesions that are worth the time and effort to surgically resect should be submitted to a qualified veterinary pathologist for complete histopathologic evaluation: this should never be optional for the owner. A complete history and clinical description of the lesion must be provided, and suspect margins tagged with suture or marked with tissue ink to allow complete evaluation. When the resected lesion is too large to submit in its entirety, multiple biopsies from all areas of the surgical margins can be submitted in a separate container; these will obviously need to be tagged or marked in some way as well. Diagrams are

useful to orient the pathologist, allowing them to pinpoint the site of each margin biopsy and then provide very precise information regarding which areas may still contain tumor cells. As with cytology samples, the accuracy of the information provided by the histopathologist is totally dependent on the quality of the biopsies they receive. Margins that are in fact clean may be evaluated as possibly incomplete if the tissue sample provided is too small and does not include the periphery of the lesion. Margins that are actually dirty may also be called clean if only a portion of the resected margin is included, but the resection happens to be complete in that area.

STEROIDS!

Corticosteroids are prescribed in many dogs and cats with neoplastic disease. They are indicated because they decrease inflammation, improve appetite, and often result in a temporary improvement in quality of life. They are also very effective in inducing remission in animals with lymphoma, and are an important part of most chemotherapy protocols for this tumor. However, use of corticosteroids should always be postponed until a thorough clinical evaluation has been completed and a definitive diagnosis of neoplasia has been obtained. They should never be used as a diagnostic "test" in a dog or cat that might have lymphoma or has undiagnosed hypercalcemia. Corticosteroids are profoundly lympholytic, and their premature use may make definitive diagnosis of underlying lymphoma impossible. Once the animal's clinical signs have responded to steroids, the only options are either to recommend an expensive course of chemotherapy for an animal that may not actually have lymphoma at all, or to withhold therapy and wait for the lymphoma to come out of remission. Corticosteroids are immunosuppressive, and if the animal has an infectious condition rather than neoplasia they may cause rapid worsening of disease. For instance, dogs with blastomycosis can sometimes appear as if they may have lymphoma, because they can have peripheral lymphadenopathy and may even be hypercalcemic. Clearly, however, corticosteroids would be a poor treatment choice in a dog with this infection. Finally,

multiple studies now show that dogs treated for lymphoma have significantly shortened survival if they are given as little as 5 days of corticosteroid treatment prior to the initiation of chemotherapy. This is believed to be the result of corticosteroid-induced multiple drug resistance (mdr), where tumor cells develop cross-resistance to multiple unrelated chemotherapeutic agents after exposure to only one. The use of corticosteroids should be restricted to cases that have been fully evaluated and situations where they are clearly indicated. When an owner makes the informed decision to try corticosteroid therapy without a diagnosis and despite the potential complications it can cause, this should be documented in the animal's permanent medical record.

LET'S JUST WAIT AND SEE...

Unfortunately, clinical procrastination is probably the most common error made by clinicians managing dogs and cats with cancer. When abnormalities related to underlying neoplasia are first detected animals are frequently sent home and instructed to recheck in a few weeks, in the hope that the identified abnormality will have resolved in the interim. A course of antibiotics or analgesics is often prescribed, more to "give the owner something to do" than in the actual expectation that it will provide any benefit. It is completely understandable that veterinarians do not want to give bad news to a long term client. However, the appropriate course of action when neoplastic disease is first found in a dog or cat is to give an honest assessment of the situation and then immediately offer full evaluation, or referral for full evaluation if necessary. If the owner makes the informed choice not to pursue diagnostics and therapy that is their choice, but they should have that choice. When an animal has cancer, waiting to see what will happen can only result in one outcome: progression of disease.

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