

Mammary Tumors in Dogs and Cats: What Do I Tell the Owner?

I consider mammary neoplasia to be one of the great embarrassments of veterinary pathology, for we have historically been excessively pessimistic about the behavior of these tumors in both dogs and cats. Most of the attention has been paid to mammary tumors in dogs. Based on a review of the worldwide literature, 50% of canine mammary tumors are described as "histologically malignant"... meaning that they have theoretical criteria of malignancy like hyperchromasia, high N:C ratio, prominent nucleoli, or increased mitotic figures. That piece of information has, unfortunately, been translated into predictions of 50% *behavioral* malignancy.

This is a massive over-estimate of the true prevalence of behavioral malignancy of canine mammary tumors. The mistake is in assuming that the histologic criteria of malignancy can be applied equally to all kinds of tumors. What we have discovered, in the last 10 years or so, is that the reliability of these histologic criteria of malignancy is different for each kind of tumor. In the case of mammary tumors, it turns out that they are not very reliable at all! Since these are the only criteria that can be assessed via cytology, the corollary of this hard-learned lesson is that cytology is essentially worthless for the prognostication of mammary tumors in dogs and cats.

In order to assist you in giving the appropriate prognostic information to owners concerned about mammary neoplasia in their pets, I have listed for you some of the more recent information about the behavior of mammary tumors in both dogs and cats.

Dogs:

1. Mammary tumors are extremely common in intact bitches. At least 70% of intact bitches will develop a clinically detected mammary tumor if they live to 15 years, and virtually 100% of them will have microscopic tumor foci.
2. Ovariohysterectomy prior to the first heat cycle virtually eliminates the risk of developing mammary neoplasia later in life. The benefits of spaying are dramatically reduced the longer one waits: the risk is reduced by about 90% if spaying is between the first and second heat cycles, and by about 70% if it is between the second and third. There is no statistical benefit (in terms of reducing mammary neoplasia) if the spaying is delayed until after the fourth heat cycle.
3. Ninety percent of all canine mammary neoplasms are behaviorally benign.
4. By far the most reliable predictor of true behavioral malignancy in canine mammary tumors is local invasion. This is easily detected by microscopic examination of excised tumors, but it can also be predicted *with 80% accuracy* by your own clinical examination. Tumors that seem to be fixed to underlying tissue, that cross the midline, or that are otherwise obviously infiltrative are very likely to be true malignancies.
5. Remember that benign mammary tumors develop from hyperplastic foci in mammary glands that have been rendered "fertile soil" by repeated cycles of hyperplasia and atrophy during normal estrus cycles. We know that a bitch with one detected mammary tumor is virtually certain to have dozens of undetected microscopic foci in the same or other glands. It is probably appropriate for you to alert the owners to that fact - without worrying them unnecessarily - by explaining that most of these foci will never amount to anything significant during the life of their dog. With increasing life expectancy, however, we can certainly expect to see more bitches developing multiple benign mammary tumors.
6. The risk that a benign mammary tumor will transform into malignancy is very low.

Cats:

Mammary tumors in cats have not been as thoroughly studied as they have in dogs, probably because the overall prevalence is substantially lower. Their relative infrequency is counterbalanced, however, by a much greater malignancy.

1. Ninety percent of all mammary tumors in cats are invasive malignancies.
2. The most important prognostic variable is the size of the tumor. Cats with mammary malignancies less than 1 cm in diameter have a 4.5 year median post-operative survival, while those with tumors greater than 3 cm in diameter at the time of excision have only a 6 month median survival. Since there is no apparent histologic difference between the large and small tumors, the reason for the profound prognostic significance of early detection and removal remains unknown.
3. Ovariohysterectomy prior to 1 year of age reduces the prevalence by 80%.
4. The high risk of metastatic disease justifies the routine removal of the regional lymph node to check for metastatic spread at the same time as you remove the primary mammary tumor. Finding tumor within the lymph node obviously allows a much more certain prognosis than assessment limited to the primary tumor itself.
5. Finally, just a reminder: beware of diagnosing mammary neoplasia when encountering rapid enlargement of one or more mammary glands in young queens in the springtime. This is almost certain to be hormone-dependent feline mammary hypertrophy, and it is not an indication for radical mastectomy! Some people use the arrival of birds or the sprouting of bulbs as signals that spring is coming. We can just as reliably use the dramatic increase in the prevalence of feline mammary hypertrophy!