

Mammary Tumors in Dogs

The Pet Health Care Library

We've all heard of breast cancer in women. With approximately one woman in eight or nine falling victim to this form of cancer, there are awareness campaigns from numerous health care agencies, and research continues. What many pet owners do not know is that the incidence of mammary tumor development in dogs is higher yet with one in four unspayed female dogs affected. This is a huge incidence, yet awareness among owners of female dogs is lacking.

Protection from Spaying

A female puppy spayed before her first heat cycle can expect never to develop a mammary tumor of any kind. The incidence of tumor development in this group is nearly zero.

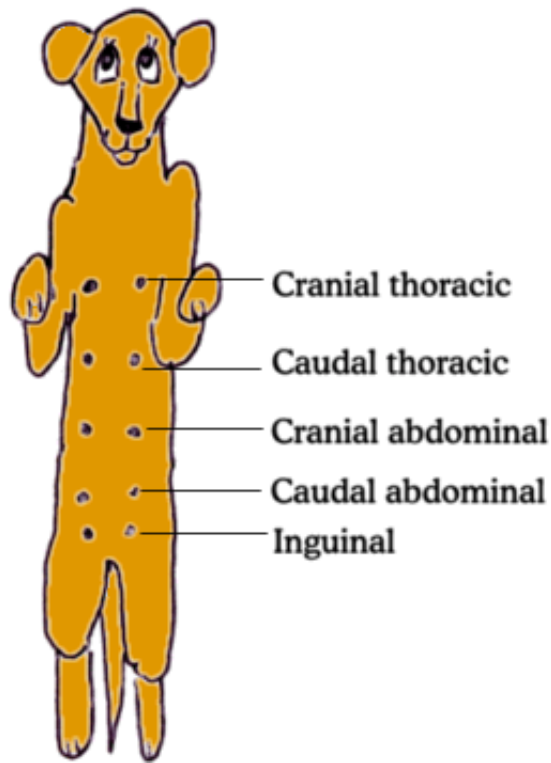


If she is allowed to experience one heat cycle before spaying, the incidence rises to 7% (still quite low).

If she is allowed to experience more than one heat cycle, the risk is driven up to one in four.

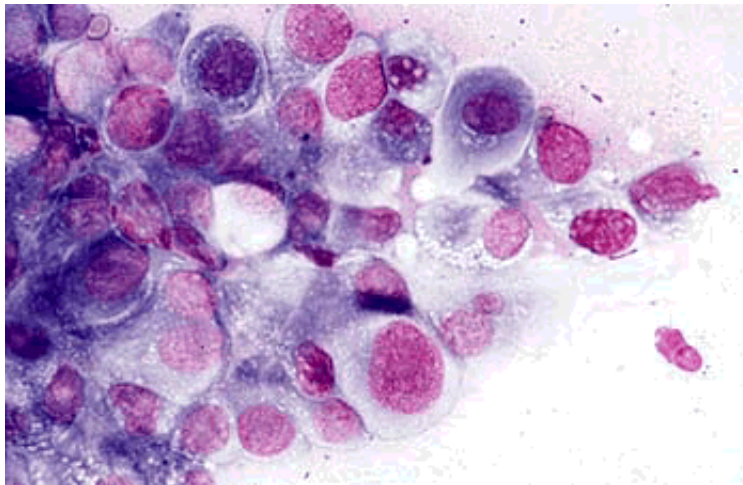
- Since most female dogs come into heat the first time before age one and breeding an immature female dog is not recommended, this means one must generally choose between a litter of puppies or mammary cancer prevention.
- Because mammary tumors are promoted by female hormones, spaying at any age is helpful in tumor prevention. Just because a female dog is in the high-risk group doesn't mean it is too late to reap benefit from spaying.

Early Detection



If your dog is unspayed, was known to have had puppies, or was spayed in adulthood, she fits into the high-risk group for mammary cancer development. It is important to be somewhat familiar with the normal mammary anatomy of the female dog. There are ten sets of mammary glands as shown though the average female dog has only nine. (It is not unusual for asymmetry of mammary glands to be found.) The normal glands should be soft and pliant, especially towards the rear legs. There should be no firm lumps. If a lump is detected, see your veterinarian at once regarding possible removal. Most tumors occur in the glands nearest the rear legs.

Benign vs. Malignant



Fine needle aspirate of a mammary carcinoma (photo courtesy of University of Georgia)

The good news, if there is some, is that approximately 50% of the tumors formed by female dogs are benign. Since one cannot tell which it is by looking at a tumor, the tumor or part of it must be removed and sampled for biopsy. The laboratory can determine whether the tumor is benign or malignant based on the cells and their architecture within the tissue. Alternatively, a needle aspirate can be performed, in which a syringe is used to withdraw some cells from the growth and the laboratory can determine whether the tumor is benign or malignant with enough accuracy to determine how aggressive the surgical approach should be. Needle aspirate may be a helpful pre-operative procedure in many cases, but it should be understood that biopsy is ultimately what is necessary to determine the extent of disease.

Hormone Receptors

Approximately 50% of malignant mammary tumors in the dog have receptors for either estrogen or progesterone. This means that the presence of these female hormones promotes the growth of these tumors. Benign tumors also have female hormone receptors and can also be stimulated by hormonal cycling of the female dog. This means that spaying is important even if a tumor has already developed; in one study, female dogs spayed at the time of mammary tumor removal or two years prior lived 45% longer than those who remained unspayed.

Types of Tumors

The following are common classes of mammary tumors that might be found on a biopsy.

Fibroadenoma:

A benign glandular tumor for which no treatment is necessary.

Mixed Mammary Tumor:

What is mixed is the type of cell that makes up the tumor: the epithelial cells that line the glandular tissue and the mesenchymal cells that make up the non-glandular portion. (Mixed does not refer to a mix of benign and malignant cells.) The mixed tumor can be either benign or malignant and the biopsy will indicate this.

Adenocarcinoma:

Adenocarcinomas can be tubular or papillary, depending on the gland cells the tumor arises from. Adenocarcinomas behave malignantly but how aggressively malignant they are depends not on whether they are tubular or papillary, but on other cellular characteristics described by the pathologist (such as how quickly the cells appear to be dividing and how closely they resemble normal gland cells). When the oncologist reads the description he or she will be able to determine how aggressively to combat the tumor.

Inflammatory Carcinoma:

A highly malignant tumor that generates tremendous inflammation locally with ulceration, pus, and discomfort. This type of tumor tends to spread early in its course and is difficult to treat. Fortunately, this especially tragic tumor type accounts for less than 5% of mammary tumors.

In general: approximately 50% of malignant mammary tumors will have already spread by the time of surgery.

This, of course, means that the other 50% are locally confined and surgery is curative.

What Else Determines Prognosis?

The type of tumor is obviously important in determining the prognosis; further, spaying at the time of tumor removal or prior is also an important factor in determining prognosis. Other factors include:

- The size of the tumor. Tumors with diameters larger than 1.5 inches have a worse prognosis than smaller tumors.
- Evidence of spread to the lymphatic system (such as the presence of tumor cells in a local lymph node or visible tumor cells within lymphatic vessels on the biopsy) carries a worse prognosis.
- Deeper tumors or tumor adherence to deeper tissue structures carries a worse prognosis.
- An ulcerated tumor surface carries a worse prognosis.
- A history of especially rapid growth carries a worse prognosis.

The biopsy sample will not only identify the tumor type, it will also indicate whether or not the tumor was completely removed (so called clean or dirty margins).

If the tumor was not completely removed, one may wish to consider a second surgery to remove more tissue.

Further Therapy?

Radiation therapy, chemotherapy, and anti-estrogen therapy have been used for incompletely removed

tumors. Sometimes it is most appropriate to monitor for recurrence with periodic chest radiographs.

Oncology is an area that not all veterinarians are comfortable performing. Discuss with your veterinarian whether referral to a specialist would be best for you and your pet.

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