

# MAMMARY GLAND TUMORS—DOGS

## BASICS

### OVERVIEW

- Benign tumors or cancer (malignant tumors) of the mammary glands in dogs
- “Mammary” refers to a breast or mammary gland
- The mammary glands produce milk to feed newborn puppies; they are located in two rows that extend from the chest to the inguinal area; the nipples indicate the location of the mammary glands

### GENETICS

- Genetic basis is possible; some genes are identified frequently in cancer of the mammary glands
- Mutations of BRCA-1 reported in some dog mammary tumors

### SIGNALMENT/DESCRIPTION of ANIMAL

#### *Species*

- Dogs

#### *Breed Predislection*

- Toy and miniature poodles, English springer spaniels, Brittanys, cocker spaniels, English setters, pointers, German shepherd dogs, Maltese, and Yorkshire terriers have been reported to have an increased risk of developing breast or mammary tumors compared to other breeds

#### *Mean Age and Range*

- Median age—about 10.5 years (range, 1 to 15 years of age)
- Uncommon in dogs less than 5 years of age

#### *Predominant Sex*

- Female; extremely rare in males

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Usually slow-growing single or multiple masses in the mammary glands—about 50% of patients have multiple tumors
- May have superficial loss of tissue on the surface of the skin over the mammary tissue, frequently with inflammation (known as “ulceration”)
- May be freely movable—implies benign behavior
- May be fixed to skin or body wall—implies malignant behavior or cancer

### CAUSES

- Unknown; likely hormonal

### RISK FACTORS

- Circumstantial evidence incriminates hormone treatment with progestins and estrogen in combination, prolactin, and growth hormone

## TREATMENT

### HEALTH CARE

- Surgery—primary mode of treatment
- Chemotherapy—may be effective, but use of chemotherapy for breast or mammary tumors is reported infrequently

### SURGERY

- Local surgical removal of a breast or mammary tumor (such as a simple, regional, or unilateral [one-sided] mastectomy) with wide and deep margins (at least 2 cm in all directions)—may be as effective in terms of disease-free interval as radical bilateral [both sides] mastectomy
- Spay or ovariectomy (OHE) in intact bitches at time of surgical removal of the breast or mammary tissue (mastectomy) may enhance survival

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Chemotherapy with doxorubicin—reported to have induced partial remission in two dogs for 12 and 16 months, respectively

- Chemotherapy with 5-fluorouracil (5-FU) plus cyclophosphamide following surgery is reported to increase survival over surgery alone
- Your dog's veterinarian may consult a veterinary oncologist (cancer specialist) for additional or updated information regarding chemotherapy

## **FOLLOW-UP CARE**

### **PATIENT MONITORING**

- As suggested by your dog's veterinarian and/or by a consulting veterinary oncologist (cancer specialist)
- Physical examination and chest X-rays—1, 3, 6, 9, and 12 months after treatment

### **PREVENTIONS AND AVOIDANCE**

- Spayed before first heat or estrous cycle—0.5% risk of developing breast or mammary tumors compared to intact bitch; spaying before the first heat or estrus is suggested to markedly decrease the likelihood of developing mammary tumors
- Spayed before second heat or estrous cycle—8.0% risk of developing breast or mammary tumors compared to intact bitch
- Spayed after second heat or estrous cycle—26% risk of developing breast or mammary tumors compared to intact bitch
- Spayed after 2.5 years of age—no sparing effect on risk of developing breast or mammary tumors

### **POSSIBLE COMPLICATIONS**

- Infection following surgery
- Splitting open or bursting along the incision line (known as “dehiscence”) following surgery
- Reduction of bone-marrow activity (known as “myelosuppression”), resulting in low number of red-blood cells, white-blood cells, and/or platelets, with chemotherapy
- Blood-clotting disorder (known as “disseminated intravascular coagulopathy” or “DIC”) with some types of breast or mammary tumors (especially inflammatory carcinomas)
- Distant spread of the cancer (known as “metastasis”) and death

### **EXPECTED COURSE AND PROGNOSIS**

- Varies with type of breast or mammary tumor (for example, benign tumor or cancer), size and presence or absence of spread of cancer (metastasis)
- Surgery for tumors that have not spread may be curative
- Median survival after surgical removal of the breast or mammary tissue (mastectomy) with tubular adenocarcinoma—24.6 months
- Median survival after surgical removal of the breast or mammary tissue (mastectomy) with solid carcinoma—6.5 months
- Benign tumor—excellent prognosis after surgical removal of the breast or mammary tissue (mastectomy)
- Carcinoma less than 5 cm in diameter—usually a good prognosis, if excision is complete
- Regional lymph-node involvement, confirmed by microscopic evaluation, makes the prognosis worse

## **KEY POINTS**

- Never watch a breast or mammary nodule to “see what happens”—a breast or mammary lump should never be left in place and observed
- Always make a plan for evaluation and possible surgical removal of any lump in the mammary gland(s)
- Early detection and surgical intervention is best
- Spaying before the first heat or estrus markedly decreases the likelihood of developing breast or mammary tumors

