

# Mammary Gland Tumors in Cats

## (Breast Tumors in Cats)

### Basics

#### OVERVIEW

- Cancerous (malignant) and benign tumors of the breast (mammary glands) in cats
- “Mammary” refers to a breast or mammary gland
- The mammary glands produce milk to feed newborn kittens; they are located in two rows that extend from the chest to the inguinal area; the nipples indicate the location of the mammary glands
- Most cancerous (malignant) breast tumors in cats are carcinomas; benign breast tumors in cats include adenomas, fibroadenomas, and papillomas
- Spread to the lungs (known as “pulmonary metastasis”) is seen in up to 70% of cats with breast cancer

#### GENETICS

- The high number of Siamese with breast tumors suggests a genetic component; however, specific genes have not been identified to date

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Cats; breast (mammary gland) tumors are the third most common type of tumor seen in cats

##### Breed Predispositions

- Domestic shorthair and longhair cats are affected most commonly, but this likely reflects the popularity of these breeds, rather than a true increased likelihood of developing breast tumors as compared to other cat breeds
- Siamese have twice the risk of developing breast tumors than other cat breeds

##### Mean Age and Range

- Mean—10–12 years of age
- Range—9 months–23 years of age (although most cats are greater than 5 years of age)
- Siamese tend to develop breast tumors at a younger age and the incidence begins to plateau around 9 years of age

##### Predominant Sex

- Females predominate



- While being intact (that is, capable of reproducing) increases the risk of breast tumors, most cats diagnosed with breast tumors are spayed females
- 1–5% of breast cancer (mammary carcinoma) occur in male cats

## **SIGNS/OBSERVED CHANGES IN THE PET**

- Masses in the breast tissue; masses may be soft or firm; smaller masses often are freely moveable, whereas larger masses may adhere to the underlying abdominal wall
- Overlying skin can be intact, but frequently is ulcerated
- Associated nipple may be inflamed, with discharge of clear fluid
- Any or all glands may be involved; the caudal two glands (near the rear legs) are affected more commonly than the other glands; left and right sides are affected with equal frequency
- Approximately 50% of affected pets have multiple gland involvement
- Infiltrated lymphatic vessels—may appear as subcutaneous (that is, under the skin), linear, beaded chains
- Cats with advanced metastatic disease may have general signs of illness (such as sluggishness [lethargy], lack of appetite [known as “anorexia”], difficulty breathing [known as “dyspnea”])
- Cats with inflammatory carcinoma may have severe ulceration; reddening of the skin (known as “erythema”); pain; fluid buildup in the ventral abdomen and pelvic limbs (fluid buildup known as “edema”)

## **CAUSES**

- Unknown

## **RISK FACTORS**

- Compared to intact female cats (those cats capable of reproducing), cats spayed at less than 6 months of age are 11 times less likely to develop breast cancer (mammary carcinoma) and those spayed between 6 and 12 months of age are 7 times less likely to develop breast cancer
- Genetic—Siamese
- Administration of progestins (such as medroxyprogesterone acetate)—increased risk of benign and malignant breast tumor development in female and male cats
- Number of litters a mother cat (known as a “queen”) has not been shown to affect breast tumor development

## **Treatment**

### **HEALTH CARE**

- Surgery is recommended for cats with tumors confined to the breast tissue, with or without involvement of the nearby lymph nodes (known as “regional lymph-node involvement”)
- Post-operative chemotherapy is recommended after the cat has recovered from surgery
- Chemotherapy can be used as the only treatment for cats that have tumors that cannot be removed surgically (so-called “inoperable tumors”), have distant spread of the cancer (metastasis), or both
- Radiation therapy can be considered to improve local control after surgery or to control inoperable tumors and improve the pet's condition, but not to cure (known as “palliative treatment”)
- Palliative treatment is recommended for cats with nonoperable tumors or significant metastasis, or when surgery and chemotherapy are declined

### **SURGERY**

- Radical mastectomy of the affected mammary (breast) chain is recommended; this significantly reduces the risk of local tumor recurrence, as well as recurrence in lymph vessels running through the breast tissue. Tumors in both mammary chains—perform two radical mastectomies, one on each chain (known as “bilateral radical mastectomies), timed usually 2–4 weeks apart
- Survival time may be increased with bilateral radical mastectomy; however, some studies suggest that unilateral (that is, one-sided) radical mastectomy may be sufficient to effectively control local disease in some pets
- In cats with advanced metastatic disease, local mastectomy to control signs and improve the pet's condition, but not to cure (palliative treatment) can be considered to remove an ulcerated or infected tumor

## **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—doxorubicin alone or in combination with cyclophosphamideOther chemotherapeutic agents (mitoxantrone, carboplatin, and docetaxel) might have activity
- Consult with a veterinary oncologist for current chemotherapy recommendations
- Pain relievers (known as “analgesics”) and antibiotics should be considered for cats with tumors that are painful, ulcerated, or both
- No available immune response modifier (known as an “immunomodulator,” such as levamisole, bacterial vaccines, and liposomal muramyl peptide) has shown effectiveness
- Tamoxifen and other selective estrogen receptor modulators have not been evaluated for safety and effectiveness

## Follow-Up Care

### PATIENT MONITORING

- Thorough physical examination—conducted monthly for the first 3 months and then every 2–3 months thereafter; emphasis on checking previous incision line(s), remaining mammary glands, and regional lymph nodes
- Chest x-rays (radiographs)—three-view radiographs taken every 2 months, to check for spread of the cancer (metastasis) into the lungs

### PREVENTIONS AND AVOIDANCE

- Spay (ovariohysterectomy)—compared to intact female cats (those cats capable of reproducing), cats spayed at less than 6 months of age are 11 times less likely to develop breast cancer (mammary carcinoma) and those spayed between 6 and 12 months of age are 7 times less likely to develop breast cancer; no obvious protective effect when cats are spayed at greater than 12 months of age

### POSSIBLE COMPLICATIONS

- Fluid buildup in the space between the lungs and chest wall (known as “pleural effusion”); life-threatening difficulty breathing (difficulty breathing is known as “dyspnea”)
- Chemotherapy—reduction of bone-marrow activity (known as “myelosuppression”), resulting in low numbers of red blood cells, white blood cells, and/or platelets; lack of appetite (known as “anorexia”)

### EXPECTED COURSE AND PROGNOSIS

- Most cats die from local recurrence of breast cancer, spread of their cancer (metastasis), or both
- Tumor size is strongly predictive of prognosis; median survival with tumor diameter greater than 3 cm is 4–6 months after surgery (1–2 months in male cats); median survival with tumor diameter of 2–3 cm, is 1–2 years (5–6 months in male cats); median survival with tumor diameter less than 2 cm is approximately 4.5 years (14 months in male cats)
- Radical mastectomy significantly reduces the risk for local tumor recurrence; the impact on survival is not as consistent because of the high rate of spread (metastasis) associated with breast cancer in cats
- For cats with advanced-stage disease treated with chemotherapy alone, response rates are around 50%, with survival times of 6–12 months for cats that have a response to treatment and less than 6 months for cats that do not respond to chemotherapy

## Key Points

- Early detection and aggressive treatment of breast (mammary gland) tumors in cats is very important
- Many affected pets have advanced disease when first presented for examination by the veterinarian
- Spay (ovariohysterectomy) at an early age (prior to 6 months) in non-breeding cats has a significant protective effect
- Given the possible genetic contribution to this disease, particularly in Siamese cats, breeding affected cats is not recommended