

Canine Mammary Gland Tumors: Understanding Your Biopsy Report

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Introduction

Mammary tumors are among the most common tumors seen in female dogs. Canine mammary tumors are heterogeneous with a wide array of histologic lesions and clinical behaviors. Approximately 50% are benign and 50% are malignant, and many diagnoses are possible in one patient. Specific diagnosis can often be achieved with biopsy. The goal of this lecture is to familiarize clinicians with common and prognostically relevant tumor types to enhance interpretation of biopsy reports. This information can be used together with other clinical prognostic factors to predict patient outcome and to plan patient management and treatment.

Risk Factors

Age, breed, diet, and spay status are known to influence the risk of mammary tumor development. The risk is increased in older dogs, in small breed dogs, especially toy and miniature breeds, in obese dogs, and in intact females. Among age groups, malignant tumors are more common in dogs 9-13 years old, and benign tumors usually are more common in dogs 7-9 years old. Spaying has a protective effect, especially if performed at a young age.

Pathology Submissions

Cytology has poor sensitivity for differentiation between benign vs. malignant mammary tumors; however, it is a useful tool for diagnosis of non-mammary tumors (i.e. mast cell tumor) or for determining an epithelial origin. Biopsy is often needed for full characterization of mammary gland masses. Biopsy samples should be removed with at least a few millimeters of surrounding tissue so that all features can be evaluated histologically for malignancy. Specimens should be submitted to the laboratory with an adequate and relevant clinical history.

Histologic Classification

Histologic lesions range from benign hyperplasia to highly malignant cancers. Over 50 types of mammary tumors can occur in the mammary gland. Understanding the terminology and clinical significance of these tumors can be overwhelming. A basic concept in mammary tumor diagnosis is the division of simple, complex, and mixed tumors. Simple tumors are composed of epithelial cells only, complex tumors are composed of epithelial cells and myoepithelial cells, and mixed tumors have epithelial cells and/or myoepithelial cells with the addition of mesenchymal tissue, usually cartilage and/or bone. Listed below are diagnoses that are either common or are associated with a worse prognosis (*italics*).

Common and *Prognostically Significant* Canine Mammary Tumors

HYPERPLASTIC/DYSPLASTIC LESIONS

Duct ectasia
 Lobular hyperplasia
 Lobular hyperplasia with atypia
 Gynecomastia

BENIGN MAMMARY NEOPLASMS

Simple adenoma
 Complex adenoma
 Benign mixed tumor
 Intraductal papillary adenoma
 Ductal adenoma

MALIGNANT MAMMARY NEOPLASMS

Carcinoma – tubular, tubulopapillary, solid
Micropapillary invasive carcinoma
Comedocarcinoma
Anaplastic carcinoma
 Carcinoma arising in a complex adenoma
 Carcinoma arising in a benign mixed tumor
 Intraductal papillary carcinoma
 Ductal carcinoma
Carcinosarcoma
*Inflammatory carcinoma**

*Inflammatory carcinoma is not a histologic subtype, but rather a clinical entity that can be associated with many malignant subtypes. It is caused by plugging of dermal lymphatic vessels with neoplastic emboli, which creates clinical signs that mimic inflammation.

Prognostic Factors

Besides the noted malignant subtypes italicized above, other histologic prognostic factors include histologic grade and the presence of vascular invasion. Carcinomas are graded I-III with grade III tumors having the worst prognosis. The grade should be included on your pathology report. Poor prognostic clinical indicators include older age, large breed (though may be more related to reduced lifespan vs. small breeds), tumor size >3 cm, intact status, and increasing clinical stage. Staging is performed according to WHO guidelines for animals.

Summary

Canine mammary tumors are common and have highly variable appearances and clinical behaviors. Biopsy is a useful tool for diagnosing the specific tumor type and can provide insight on prognosis. This lecture has attempted to provide a basic understanding of common tumor types and has highlighted keywords to look for on your biopsy report that should alert you to a poor prognosis. The table below depicts a subjective emotional scale for the range of diagnoses you might see on your biopsy report.

Interpreting Your Histologic Diagnosis

Good news!	Good news for now, could be a problem in the future	Somewhat bad news	Bad news	Very bad news
Ectasia Hyperplasia Adenoma	Hyperplasia with atypia <u>Epitheliosis</u> with atypia	Carcinoma grade I	Carcinoma grade II <u>Invasive micropapillary carcinoma</u>	Carcinoma grade III <u>Comedocarcinoma</u> Anaplastic carcinoma Carcinosarcoma Inflammatory carcinoma
				

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