Liver Tumors in Dogs and Cats

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Tumors in the liver typically arise in older animals, and may be the result of a primary liver tumor (originating in the liver), hemolymphatic cancer (arising from blood cells or lymphoid tissue) involving the liver, or metastatic cancer (cancer that has spread to the liver from other areas of the body). Most metastatic liver cancer arises from the spleen, pancreas, or intestinal tract.

Primary liver cancer is rare, and is generally classified as *hepatocellular carcinoma (HCC)*, *bile duct carcinoma*, *neuroendocrine* (or carcinoid) *tumor*, and *mesenchymal tumor* (sarcoma). The most common primary liver tumor in dogs (second most common primary liver tumor in cats) is hepatocellular carcinoma (HCC). These tumors can be *massive* (comprised of a single large tumor), or *nodular* (several discrete masses within one or multiple liver lobes), or *diffuse* (involvement of the entire liver). The majority of HCC are of the 'massive' form, and have a lower rate of metastasis as compared with the nodular or diffuse forms. Bile duct (biliary) carcinomas are the most common malignant liver tumor in cats (second most common in dogs). Neuroendocrine tumors are rare, and usually nodular or diffuse. Primary sarcomas of the liver are unusual, and include hemangiosarcoma, fibrosarcoma, and leiomyosarcoma, among other tumor types.

Primary liver tumors can metastasize (spread) to other areas of the liver, as well as to other areas of the body, including lymph nodes, other abdominal organs, and the lungs. Most HCCs are however quite indolent in behavior and meatstasis is relatively rare. Metastasis is somewhat more common with neuroendocrine tumors, bile duct carcinomas, and nodular or diffuse HCC.

Benign tumors such as hepatocellular adenoma, bile duct adenomas, hemangioma, leiomyoma, and hepatomas can also occur within the liver. Benign bile duct cystadenomas are the most common primary liver tumor in cats. They are cystic (fluid-filled) in nature, and often do not produce clinical signs of illness. Benign tumors do not spread, and generally do not cause illness unless they physically impinge upon other organs or structures within the abdomen, or rupture and bleed.

Animals with liver tumors can be asymptomatic, or alternatively, can exhibit nausea or vomiting, weight loss, loss of appetite, diarrhea, abdominal distension, lethargy, or increased drinking and urination, among other signs. Occasionally, discoloration or yellowing of the skin and eyes (jaundice), or neurological signs, such as seizures, disorientation, stumbling, and weakness, can be seen.

Suspicion of liver cancer may be based on a patient's symptoms, or on physical exam abnormalities, such as a palpably enlarged liver or detection of free fluid in the abdomen. Blood tests are not specific for these cancers, but can reveal signs of liver damage or dysfunction, as well as bile duct obstruction. Bloodwork (complete blood count, chemistry panel), urine sampling, imaging (chest x-rays, abdominal ultrasound), and sampling of the affected tissues via needle aspiration or biopsy are often performed at an animal's initial visit to determine the extent of tumor in other areas of the body and provide important information regarding a patient's overall health and ability of the patient to handle treatment.

Treatment: Surgery if possible (depending on size and extent of disease) is the treatment of choice for most primary liver tumors. With massive HCC, surgical excision may be curative, even with large tumors.

Due to its regenerative capacity, a large portion of the liver can be removed safely. Benign tumors and massive HCC tend to grow slowly, and surgery can be highly beneficial in alleviating any clinical signs associated with the tumor. Dogs who have complete removal of their HCC can potentially live for years post-operatively.

Malignant tumors that cannot be surgically removed, nodular or diffuse HCC, and those with metastatic spread to or from other sites carry a poor prognosis. The role and efficacy of systemic therapy has not been well defined in primary liver tumors. However, palliative chemotherapy and other medical treatments may be attempted to delay the progression, but care must be taken so that the side effects are minimized and that the benefit is confirmed with repeated tumor measurements in these patients. Newer methods, such as chemoembolization and intraarterial chemotherapy using minimally invasive interventional radiology, are currently being investigated for the treatment of liver tumors; however the true benefit of these treatments is unknown. Prognosis is poor in dogs and cats with bile duct carcinoma and neuroendocrine tumors despite surgical excision due to the high rate of local recurrence and metastasis.