

CANINE HEPATOCELLULAR CARCINOMA (CHC) IN DOGS

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Hepatic neoplasia is cancer of the liver. The words cancer, neoplasia or neoplasm, and tumor are often used interchangeably. Neoplasia in the liver may be the result of a primary liver tumor (one that originates in the liver), hemolymphatic cancer (arising from blood cells or lymphoid tissue) that involves the liver, or metastatic cancer (cancer that has spread to the liver from other organs). Before discussing about dog liver cancer, let's first understand about the functions of liver. Liver is the largest organ responsible for performing a multitude of functions; some of which include body detoxification, neutralization of harmful toxins present in the blood, fighting infections, aiding digestion by secreting bile juice and boosting immune system. One of the characteristic features of liver is that it can perform its normal functions, even if 60 - 70 percent of the total mass is affected by disease (Liptak *et al.*, 2004). While this feature benefits the pet so that it can function normally despite being in a diseased condition, it also means that liver disease is well advanced before the onset of any noticeable symptoms.

Any abnormality in the cells and/or tissues of liver can cause liver disease. As liver functions as a biochemical active center, it is susceptible to developing a wide range of diseases viz., infections, cancer and degenerative disease. Almost all dogs are at risk to developing liver disease, which can be either cancerous or non-cancerous. Let's discuss in brief about dog liver cancer, its symptoms and treatment options.

The most common form of liver cancer in dogs is metastatic disease. Primary liver cancer is rare, comprising less than two percent of all cancer seen in these species (Kevin, A. Hahn, 2002). When it does occur, the most common primary liver tumors seen in dogs are hepatocellular carcinomas, which are malignant tumors that arise from the liver cells, and hepatocellular adenomas or hepatomas, which are benign tumors that arise from the liver cells.

The cause of primary liver cancer may be related to environmental factors. Exposure to

carcinogens, or cancer-causing chemicals, may increase the risk of cancer development. Many chemicals are not toxic until they are metabolized by the liver. The liver serves an important role in detoxifying many substances circulating in the body. However, some chemicals are made more toxic after they have been broken down by the liver. Examples of possible carcinogens include toxins produced by fungi that are sometimes associated with spoiled pet food, food additives, certain pesticides, dyes, plants and animal tissue. Viral infections have been associated with hepatic cancer in humans. This has not been shown in dogs. Primary liver cancer is most common in pets greater than 10 years of age. There is a slightly increased risk of hepatocellular carcinoma in males compared to females. The impact of the disease on the pet varies depending on the tumor type. Benign tumors do not spread and generally do not cause illness unless they are physically impinging on other abdominal organs, or if they rupture and bleed. Occasionally, large benign liver tumors cause hypoglycemia (low blood sugar) by probable release of insulin-like substances. Insulin is the hormone that controls blood sugar levels, and is normally produced by the pancreas.

Causes and Symptoms

Dog liver cancer can be caused due to ingestion of toxic chemicals, heavy metals and exposure to carcinogens. After the pet dog consumes these toxic chemicals, they pass liver for detoxification process, thus increasing the chances of developing liver cancer.

In dogs, there are two types of liver cancer, namely, primary and secondary or metastatic tumors. Primary liver cancer is more common than secondary type; it occurs due to presence of malignant tumors in the tissues of liver. Primary dog liver cancer has the potential to spread to other parts of the body. Secondary dog liver cancer, on the other hand, is caused due to spread of malignant tumors from other body organs.

Diagnosis and Treatment

Since liver performs a wide range of functions, it is obvious that dog liver cancer will affect almost all the other parts of the body. Hence, symptoms of liver cancer are always vague and confused with other canine illnesses. The notable symptoms of dog liver cancer are loss of appetite, vomiting, weight loss, abdominal distension, stomach pain, gum problems, difficulty in breathing or increased in respiratory rate and jaundice.

Diagnosis of dog liver cancer is done by physical examination of the pet and conducting liver biopsy. Increased level of bile in the blood or urine, as well as an enlarged or inflamed liver can be an indication of liver cancer of the pet. For confirmation, the veterinarian may conduct

blood tests in order to check for increased levels of enzymes such as Serum Glutamic Pyruvic Transaminase (SGPT) and Alkaline Phosphatase. The Contrast Enhanced Ultrasound is also helpful in the diagnosis (Fig. 1&2).

For treatment of primary liver cancer in the early stages, surgical removal of the affected liver lobe is the most effective technique. However, surgery is not recommended in case cancer has spread to multiple lobes. Regarding secondary dog liver cancer, the only treatment option is chemotherapy. The main objective behind the treatment of dog liver cancer is to improve the quality of life for the pet, but not to increase the lifespan. One can make the pet comfortable by feeding healthy dog foods, giving recommended doses of chemotherapy and taking proper care of the pet.



Fig: 1
Multiple Focal Lesions on Ultrasonography (Hyperechoic and Mixed)

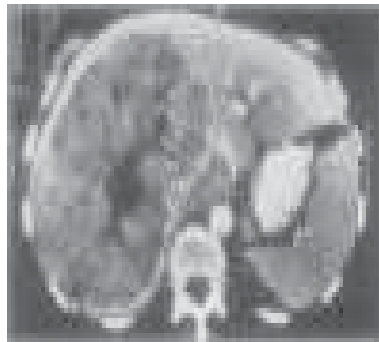


Fig: 2

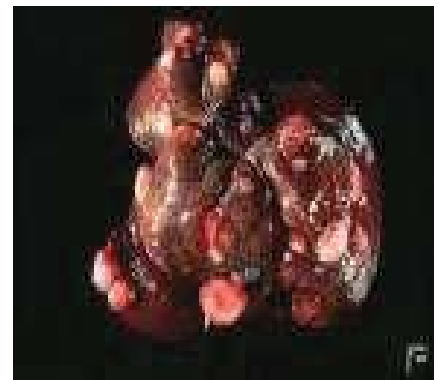


Fig: 3. Multiple Focal Lesions on Post Mortem

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