



Understanding Lymphoma in Dogs: Causes, Symptoms, Diagnosis, and Treatment Options

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Abstract

Canine lymphoma is a prevalent cancer affecting the lymphatic system of dogs, characterized by the abnormal proliferation of lymphocytes. This malignancy can manifest as a localized or systemic disease, with multicentric lymphoma being the most common form. While the exact etiology remains unclear, certain breeds show predisposition, suggesting a potential genetic component. Diagnosis typically involves fine needle aspirate or biopsy of enlarged lymph nodes, with additional tests like immunohistochemistry aiding in subtype classification. Clinical signs vary based on the affected organs, ranging from lymph node enlargement to gastrointestinal or respiratory symptoms. Prognosis depends on various factors, with untreated dogs having a survival time of four to six weeks, while those undergoing chemotherapy may achieve remission with an average survival time of around one year. Further research is needed to elucidate the underlying mechanisms of canine lymphoma and improve treatment outcomes for affected dogs.

Keywords: Chemotherapy, Lymphoma, Fine needle aspiration

Introduction

Lymphoma, a cancer affecting the lymph nodes and the lymphatic system, can manifest either locally or spread throughout a dog's body. The lymphatic system comprises lymph nodes, specialized organs like the spleen and tonsils, and vessels crucial for fluid movement and immune response to toxins or infections.

This cancer accounts for 15-20% of new cancer diagnoses in dogs and is more prevalent in middle-aged and older dogs. While there's suspicion of a genetic component in certain breeds, it hasn't been conclusively confirmed. Breeds like Chow Chow, Golden Retriever, and German Shepherd are among those more predisposed to lymphoma.

There are four different types of lymphoma in dogs, varying in severity and prognosis:

Multicentric (systemic) lymphoma: This is, by far, the most common type of canine lymphoma. Multicentric lymphoma accounts for approximately 80-85% of cases in dogs. In multicentric lymphoma, lymph nodes throughout the body are affected.



Alimentary lymphoma: This type of lymphoma affects the gastrointestinal tract. Alimentary lymphoma is the second most common type of lymphoma.

Mediastinal lymphoma: In this rare form of lymphoma, lymphoid organs in the chest (e.g., lymph nodes, thymus) are affected.

Extranodal lymphoma: This type of lymphoma targets a specific organ outside of the lymphatic system. Extranodal lymphoma is rare but may develop in the skin, eyes, kidney, lung, or nervous system.

Clinical signs of canine lymphoma

Multicentric (systemic) lymphoma in dogs typically presents with noticeable swelling of the lymph nodes in various regions such as the neck, chest, armpits, groin, and behind the knees. These swollen lymph nodes can be easily observed by the dog's owner or detected during a routine physical examination by a veterinarian. Interestingly, many dogs with multicentric lymphoma do not exhibit any other clinical signs of illness at the time of diagnosis. However, if left untreated, they may later develop symptoms such as weight loss and lethargy.

In contrast, the less common forms of lymphoma in dogs manifest with clinical signs that depend on the affected organ. Alimentary lymphoma, for instance, leads to gastrointestinal lesions, resulting in symptoms like vomiting, diarrhea, and weight loss. Mediastinal lymphoma, on the other hand, causes lesions within the chest cavity, leading to symptoms such as coughing and shortness of breath. The effects of extranodal lymphoma vary greatly depending on the specific organ involved.

Diagnosis

Not all dogs with enlarged lymph nodes have lymphoma. Enlarged lymph nodes may also occur due to infections or autoimmune diseases, so a veterinarian will perform tests to determine the cause of a dog's clinical signs.

The primary diagnostic test for lymphoma in dogs is a fine needle aspirate (FNA), wherein a veterinarian inserts a needle into an enlarged lymph node or organ to collect a small number of cells. These cells are then examined under a microscope to detect cancerous cells indicative of lymphoma. If the FNA results are inconclusive or if the location of the lesion makes the procedure impractical, a biopsy may be performed. This involves surgically removing a tissue sample from the affected lymph node or lesion for microscopic examination to confirm lymphoma.

Additionally, baseline screening bloodwork is typically conducted to evaluate the dog's overall health. This bloodwork comprises two components: a complete blood cell count, which assesses various cell types in the blood including red blood cells, white blood cells, and platelets; and serum biochemistry, which evaluates the function of internal organs.



Upon confirming a diagnosis of lymphoma, the veterinarian may recommend additional tests to gather more information about the specific type and extent of the lymphoma, aiding in the development of a treatment plan. These tests may include immunohistochemistry to differentiate between different types of lymphoma, flow cytometry to distinguish B-cell from T-cell lymphoma, and imaging studies such as radiographs or ultrasounds to determine the extent of the disease.

In contrast to the common systemic form of lymphoma, less frequent types of lymphoma in dogs manifest with clinical signs specific to the affected organ. Alimentary lymphoma, for example, leads to gastrointestinal symptoms such as vomiting, diarrhea, and weight loss. Mediastinal lymphoma causes respiratory symptoms like coughing and shortness of breath due to lesions in the chest cavity. The clinical presentation of extranodal lymphoma varies depending on the particular organ involved.

There are five stages of lymphoma. Stage I and II are rarely observed in dogs, while Stages III-V are.

- **Stage I:** involves only a single lymph node
- **Stage II:** involves lymph nodes on only one side of the diaphragm (only affects the front of the body or rear of the body)
- **Stage III:** generalized lymph node involvement
- **Stage IV:** involves the liver and/or spleen
- **Stage V:** involves the bone marrow, nervous system, or other unusual location

Treatment

Lymphoma is treated with chemotherapy that is CHOP-19. There are a variety of procedures used, but most consist of a variety of injections given every week. Fortunately, dogs tend to tolerate chemotherapy better than humans; they rarely lose their hair or seem to feel ill during chemotherapy. The most common side effects of chemotherapy include vomiting, diarrhea, and decreased appetite, though even these effects are not seen in all dogs. If chemotherapy is not an option due to patient factors or owner financial constraints, prednisone can be used for palliative care. Although prednisone does not treat lymphoma, it can temporarily reduce clinical signs and buy the pet some time. Surgery and/or radiation may be appropriate for certain types of low-grade localized lymphoma, but most cases cannot be successfully treated with surgery or radiation.

Prognosis

The prognosis for lymphoma in dogs varies based on specific characteristics determined through specialized testing. On average, untreated dogs or those treated solely with prednisone

typically survive for four to six weeks, although outcomes can vary widely. Some dogs may be euthanized or pass away before the four-week mark, while others may survive beyond six weeks.

With chemotherapy, lymphoma can often be induced into remission, although it's important to note that lymphoma is not typically cured. Remission refers to the temporary resolution of all signs of the disease. On average, dogs in remission following chemotherapy experience a remission period of eight to nine months, with an average survival time of around one year. However, individual outcomes may differ, with some dogs passing away earlier and others living longer than one year. Your veterinarian can offer more specific information regarding your pet's prognosis if additional testing is pursued to further characterize the lymphoma.