

CANINE MULTICENTRIC LYMPHOMA

Lymphosarcoma (lymphoma) is one of the most common cancers diagnosed in dogs. It is a cancer of lymphocytes (a type of blood cell) and lymphoid tissues. Lymphoid tissue is normally present in many places in the body including lymph nodes, spleen, liver, gastrointestinal tract and bone marrow. Lymphoma comes in several forms, gastrointestinal, mediastinal (chest), multicentric (involving many lymph nodes) and extranodal (involving organs such as the eyes, brain, kidney, skin, etc). Most dogs have the multicentric form (80-85%) which involves all of their lymph nodes. The average dog with lymphoma is between 6-9 years although dogs of any age can be affected. Certain breeds (Boxer, German Shepherd, Golden Retrievers, Labradors, Scotties, Westies) may be more likely to develop this type of cancer. Males and females are equally at risk. In most cases, we cannot tell what causes lymphoma in dogs. The diagnosis for this cancer is based upon either cytology of a lymph node (needle aspirate) or a biopsy of an abnormal lymph node or organ.

Multiple diagnostics are recommended in order to "stage" the disease, or in other words, to determine if the lymphoma cells are in other parts of the body besides the lymph nodes (i.e. the spleen, liver, bone marrow, or other organs). These tests include a CBC and serum chemistry to evaluate all body systems and monitor electrolytes, kidney function, and liver damage; urinalysis to monitor kidney function and to look for infection or other changes; chest radiographs (x-rays) to look for evidence of spread to the chest cavity, lymph nodes, or lungs; abdominal ultrasound to evaluate the spleen, liver, other organs, and abdominal lymph nodes for evidence of the cancer; occasionally flow cytometry to identify B-cell versus T-cell lymphoma, and occasionally a bone marrow aspirate to look for presence of cancer in the bone marrow. For the multicentric form of lymphoma, the results of the "staging" process help to determine the placement into one of five stages of disease:

Stage I: Cancer involving one lymph node.

Stage II: Cancer involving more than one lymph node but on one side of the diaphragm.

Stage III: Generalized lymph node involvement.

Stage IV: Spleen or liver involvement, with or without the previous stages.

Stage V: Bone marrow involvement or extension to other non-lymphoid organs (intestines, lungs, etc).

Dogs are also substaged into either "substage a" (a dog who is not sick) or "substage b" (a sick dog). Lymphoma can also be categorized by its "immunophenotype" which is the type of cell that mutated to become cancerous. It can be either a B-cell or T-cell lymphoma. This difference is important for prognosis because T cell lymphoma tends to be more resistant to the chemotherapy drugs and thus these patients do not do as well with treatment. Boxers, dogs with high calcium levels in their blood, and/or the mediastinal form of lymphoma are more likely to be T-cell lymphoma.

This "staging" process mentioned above is important because it helps us predict prognosis and how well our patients will respond to chemotherapy. Specific important prognostic factors include substage ("a" does better than "b"), bloodwork abnormalities (animals that are hypercalcemic do worse than animals with normal calcium levels), and lymphoma cell type (B-cell lymphomas do better than T-cell lymphomas). The most important predictive factor

is response to treatment once it is started. Not all of these tests are medically necessary, and they are most often used to provide a baseline of where the cancer is located and to give information about prognosis.

Without any therapy, most patients with this cancer would likely have a survival time of approximately 1-3 months, depending on the level of their cancer. This can improve with the addition of steroids (prednisone) to an average of 3-5 months. This therapy alone cannot keep the disease under control for very long because the cancer cells quickly become resistant to this medication. In general, lymphoma is thought to be a "systemic" disease and is best treated with systemic chemotherapy. There are many chemotherapy treatment options available for pets with lymphoma. The standard of care chemotherapy protocol (University of Wisconsin/CHOP protocol) contains four main drugs including prednisone, vincristine, cyclophosphamide (Cytoxan), and doxorubicin (Adriamycin). Other treatments may be included into this protocol, used in different combinations, or used as single-agent treatments. These are l-asparaginase, lomustine (CCNU), rabeprazole (Tanovea), dacarbazine (DTIC), mitoxantrone, cytarabine, verdinexor (Laverdia-CA1), and others. The treatment protocols available for your pet may be dependent on the location of the lymphoma, specific type of lymphoma (B cell or T cell), whether or not your pet has other medical conditions such as heart disease or liver disease, or other factors.

With the standard chemotherapy protocol (University of Wisconsin/CHOP) we have found that most dogs will go into complete remission, meaning no clinical evidence of the cancer. In general, we estimate that the average survival time for dogs with lymphoma receiving the standard chemotherapy protocol is about 12 months. Some dogs will live longer and some shorter. This estimate is decreased to approximately 6-8 months if a dog is substage b, has a T-cell lymphoma, has hypercalcemia, or has involvement of other organs such as the mediastinum, kidneys, GI tract, or nervous system. For patients who have progression of their lymphoma on the standard chemotherapy protocol, other chemotherapy protocols can be considered. Overall response likelihood and prognosis is different with other chemotherapy protocols and agents and these details can be reviewed during a consultation with your veterinary oncologist.

Please remember that each patient is an individual and can have variable presentations of their cancer and response to treatment. Specific details and recommendations for your pet can be discussed in detail during a consultation with the oncologists at the Animal Cancer Center of Texas.