

INFORMATION SHEET

Lymphoma in dogs

Lymphoma, previously known as lymphosarcoma, is a cancer of lymphocytes (a type of white blood cell) and lymphoid tissue. This cancer usually occurs in lymphatic tissues, such as lymph nodes, spleen, liver, digestive tract and bone marrow; however, it can arise in any tissue including the skin, brain, spinal cord, bones or heart. The exact cause of lymphoma is unknown.

Clinical signs

The most common form of lymphoma in dogs is a *multicentric* form, which involves many of the body's lymph nodes. Often the only noticeable sign is an enlargement of the lymph nodes under the neck, behind the knees or in front of the shoulders. Other organs, such as the liver, spleen and bone marrow, may be involved. Many dogs with lymphoma feel well or have only very mild clinical signs, such as lethargy or decreased appetite. Others may have more severe clinical signs, including weight loss, vomiting, diarrhoea, excessive thirst or urination, weakness, neurological signs or a difficulty in breathing. Less commonly, we may see lymphoma in only one organ or tissue of the body and it may involve the local draining lymph node.

Diagnosis and staging

The diagnosis of lymphoma involves taking a fine needle aspirate or biopsy from the affected tissue (usually a lymph node but can be any tissue involved such as spleen, liver, intestine). A biopsy involves taking a larger sample and is preferred over an aspirate as we can request a special test (immunohistochemistry) that tells us the specific type (or cell of origin) of lymphoma, which can be T or B cell. This information can provide a more accurate prognosis, and the different types are treated differently. Staging involves screening the body to look for cancer elsewhere. For lymphoma this involves performing a bone marrow aspirate, abdominal ultrasound and chest radiographs. Blood tests (a complete blood count and biochemistry) and urinalysis are performed to screen for cancer circulating in the bloodstream and are also important to establish the general health of the patient prior to treatment. While staging is performed to assess the extent of disease, it does not tend to alter treatment recommendations or prognosis and can be forgone in some cases. A bone marrow aspirate is more important as significant bone marrow involvement will increase the risk of toxicity with chemotherapy. As a minimum we recommend an aspirate or biopsy to confirm the diagnosis, blood and urine tests and preferably a bone marrow aspirate (but this is not always essential).

Treatment and prognosis

Lymphoma is considered a cancer of the whole body, as the cancerous lymphocytes circulate the body in the blood and

lymphatic system. Therefore it is important that we give a therapy that treats the whole body. Chemotherapy is the mainstay of treatment for lymphoma and up to 95% of dogs treated will go into complete remission. Complete remission is the complete disappearance of all signs of the cancer leading to a normal quality of life, but it is not a cure. That is why it is important to continue chemotherapy for the entire protocol even after complete remission is obtained. There are many chemotherapy protocols available that vary in intensity and cost. Those that use more than one chemotherapy drug (multi-drug protocols) tend to have higher response rates and longer survival times and can be more expensive. Protocols that use only one drug (single agent protocols) are less expensive, but tend to have lower response rates and shorter survival times. The most commonly used chemotherapy drugs for lymphoma are vincristine, cyclophosphamide and doxorubicin and we typically use a combination of these. These drugs are alternated to reduce the chance of the tumour cells becoming resistant and to reduce the risk of side effects. Chemotherapy is generally well tolerated in animals (please see the 'Chemotherapy in animals' information sheet).

In some cases if the cancer is confined to one area and staging tests are negative we may recommend surgery followed by chemotherapy, but this is less common. The average survival time for dogs with *multicentric* lymphoma treated with chemotherapy is 12 months and approximately 25% may live two years. Cure is possible, but is uncommon, occurring in about 10% of patients. These are averages only and some may live for much shorter or longer periods of time. It is difficult to predict how any individual patient will respond. One of the most important prognostic factors for lymphoma is whether or not the patient is well or sick at the initial diagnosis. If the patient is well the prognosis is improved and chemotherapy is generally tolerated better. Without chemotherapy patients can be treated with corticosteroids, which may improve their quality of life. The average survival time for patients treated with corticosteroids alone is 4–8 weeks and with no treatment at all it may be less than four weeks.

Follow up

Once the patient finishes chemotherapy and remains in complete remission, we recommend a recheck in one month and then every three months to screen for recurrence of lymphoma. Relapses can be treated for a second time with chemotherapy. Approximately 80% will go into a second complete remission, the length of time which is on average approximately two-thirds of the first remission.