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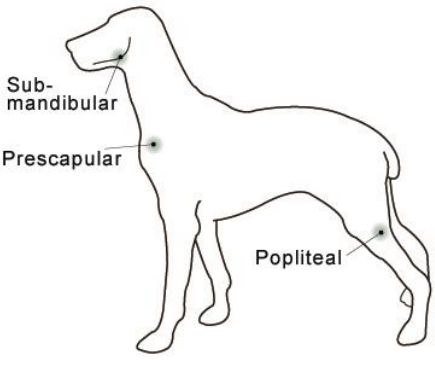
Lymph Node and Other Lymphoid Tumors

These notes are provided to help you understand the diagnosis or possible diagnosis of cancer in your pet. For general information on cancer in pets ask for our handout "What is Cancer". Your veterinarian may suggest certain tests to help confirm or eliminate diagnosis, and to help assess treatment options and likely outcomes. Because individual situations and responses vary, and because cancers often behave unpredictably, science can only give us a guide. However, information and understanding for tumors in animals is improving all the time.

We understand that this can be a very worrying time. We apologize for the need to use some technical language. If you have any questions please do not hesitate to ask us.

What is the lymphoid system?

Lymph is a fluid which circulates in the body, transporting cells of the immune system (lymphocytes and macrophages) and draining areas where excess fluid or debris has accumulated, for example in inflammation. Macrophages (literally "big eaters") are cells that "eat" (phagocytose) and digest other cells, infections and debris. They also collect and carry antigens to the lymphocytes. Macrophages are filtered out of the lymph in swellings called lymph nodes (glands). Within lymph glands there are concentrations of lymphocytes. The 'B' type lymphocytes, through their derivative 'plasma cells', make antibodies to the antigens brought by the macrophages (humoral immunity); and the 'T' type lymphocytes prepare themselves to attack the foreign antigens (cellular immunity).



Major Superficial Lymph Node Locations

Before birth, **T** lymphocytes develop in the **t**hymus in the chest and **B** lymphocytes in the **b**one marrow. Throughout life, in addition to the lymph nodes there are accumulations of lymphoid tissue in areas where they are likely to meet foreign antigens. These include the tonsils in the throat, and throughout the respiratory and intestinal tracts. Lymphoid tissue is also a major part of the spleen, which filters blood.

What are the different types of tumor?

Cancer of the cells of the lymph nodes (**lymphoma**, **lymphosarcoma**) has to be distinguished from other causes of lymph node swelling by histopathology. Some types of cancer are slower growing than others but all are potentially life-threatening. Cancer can start in any lymphoid tissue.

Swelling of the lymph nodes may also be due to increased activity (hyperplasia) caused by generalized or regional infection or other antigenic stimulus. It can also be due to inflammation (lymphadenitis) within the lymph node. Sometimes the node is simply caught up in surrounding inflammation but some infectious organisms protect themselves by living

inside lymphocytes and macrophages. These infections include immunodeficiency viruses, tuberculosis and a protozoan parasite called Leishmania. A few lymph nodes swell because cancer cells from other tissues have travelled through the lymph and multiplied in the lymph nodes.

What do we know about the cause?

Infections are important causes of lymphoid cancers. Feline leukemia virus (FeLV) causes a variety of cancers of the blood and lymph system in cats. Different strains of the virus cause cancers at different times. If a cat is also infected with Feline immunodeficiency virus (FIV), the risk of developing cancer increases. Recently, a virus infection has been demonstrated in dog leukemia (cancerous lymphocytes in the blood). Lymphoid tumors starting in the intestine may, as in people, be promoted by *Helicobacter* bacterial infection. However, not all lymphoid cancers are associated with infections so other genetic and environmental factors are also important.

Why has my pet developed this cancer?

Your pet may have a genetic tendency to cancer and have had an infection or contact with chemicals in the environment that have initiated or promoted the cancer. Your cat may currently be infected with FeLV or FIV or have been exposed to viral infection.

Are these common tumors?

These are common cancers. In dogs, the risk of developing these tumors is 13-24 cases of lymphosarcoma (lymphoma) per 100,000 dogs. Pups as young as four months may have these cancers but 80% of cases occur between the ages of 5 and 11 years. Boxers have a higher incidence than other breeds.

Lymphosarcoma is the most common cancer in cats making up approximately one in three cancer cases. In surveys, the incidence is 50-200 per 100,000 cats. The age of tumor onset has two peaks, one in early adulthood at about two years of age and a second in mature cats aged 6-12 years. Cats as young as six months may be affected and purebred cats such as Siamese are predisposed to the cancers. Male cats may have more cancers than females.

With FeLV testing and vaccination, there has been a massive decline in FeLV positive cats but not in the incidence of tumors. However, more older and less young cats now develop the tumors. Tumors of the thymus still occur in young cats but tumors in lymph nodes, multiple organs and the intestine are more common in older cats. Tumor incidence varies from region to region and in different countries.

How will these cancers affect my pet?

Four out of five dogs have tumors that start in multiple places (multicentric). There is bilateral and symmetrical swelling of the lymph nodes without pain. Other signs depend on the organs involved and include lassitude, fever, weight loss, diarrhoea, increased urination, small bleeding points and anaemia. Some dogs have abnormal lymphocytes in the blood (leukaemia).

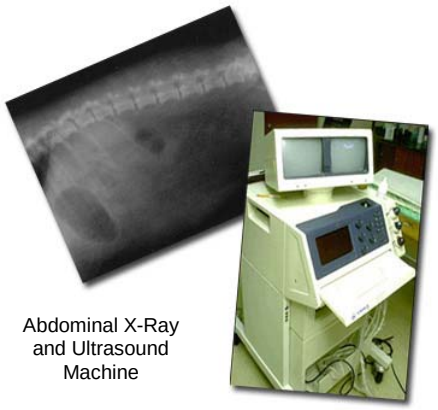
Most cats present with masses in the chest or abdomen and therefore respiratory difficulty or weight loss, diarrhoea or constipation and vomiting. Kidney failure and anaemia are also common. The thymic (chest) type is commonest in young cats.

About 10% of these tumors induce signs that are not readily explained by spread of the tumors. These are known as paraneoplastic syndromes. Some are due to abnormal hormone production by the cancer. Examples include increased blood calcium levels and

increased blood gamma globulin (immune system related protein). Both these adversely affect kidney function with increased thirst and urination.

How are these cancers diagnosed?

Cancer is often suspected from clinical signs, particularly physical examination by your veterinarian. X-rays and ultrasound may be useful in detecting internal tumors. Checking for FeLV antigen in the blood can sometimes be helpful in cats, but this is not a consistent feature of all tumors nor are other blood abnormalities.



Abdominal X-Ray and Ultrasound Machine

In order to identify the tumor definitively, it is necessary to obtain a sample of the tumor itself. Various degrees of surgical sampling are used such as needle aspiration, punch biopsy, full excision or exploratory surgery. The tissue samples are submitted for microscopic examination. Cytology is the microscopic examination of cell samples (often useful for rapid or preliminary tests). Histopathology is the microscopic examination of specially prepared and stained tissue sections. This is done at a specialized laboratory where the slides are examined by a veterinary pathologist. The information from this examination is more detailed and reliable than cytology.

The histopathology report typically includes additional information that helps to indicate how the cancer is likely to behave. Diagnosis of lymph node cancers can be difficult and enlarged lymph nodes are not all cancerous. Some types of hyperplasia also progress to neoplasia (cancer) so repeat sampling may be needed for certain types.

What types of treatment are available?

A few tumors (e.g. in the intestine) are solitary, but most have already spread before diagnosis and surgery. It is currently believed that once cancer is present, there are always a few cancer cells circulating in the blood. The potential for spread of the cancer is determined by the 'homing' patterns of the tumor cells, which permits them to attach in some sites. Removal of an enlarged lymph node, tonsil or other site does not cure the disease although it does slow the progress of some types.

In some countries, chemotherapy is used to induce remission of disease and prolong life. It rarely cures the disease. Significant remission is more likely for smaller and more rapidly dividing tumors. The drugs used are toxic to organs with dividing cells such as the intestine, bone marrow and skin. Some are also toxic to other organs such as the liver and nerves so may induce malaise. The best system of chemotherapy is still uncertain.

Steroid drugs such as prednisolone will give short-term palliation up to a few months. However, their use may promote resistance to other chemotherapy drugs and may shorten remission of subsequent multi-drug chemotherapy.

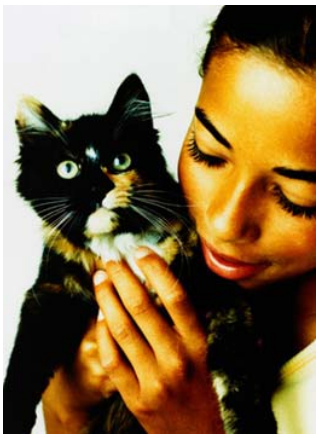
Can these cancers disappear without treatment?

In people, early intestinal cancers due to *Helicobacter* infection can disappear if the infection is cured. We do not know if this happens in animals. As all of these cancers have ready access to the lymph and blood transport systems, they are often widespread before diagnosis so even loss of blood supply to one tumor does not cause the cancers to

disappear. Poor blood supply and degeneration of internal tumors is relatively common but does not eliminate them.

How can I nurse my pet?

After biopsy or surgery, your pet must not interfere with the operation site, which needs to be kept clean. Any loss of stitches or significant swelling or bleeding should be reported to your veterinarian. You may be asked to check that your pet can pass urine and feces or to give treatment to aid this. He or she may also require a special diet. If you require additional advice on post-surgical care, please ask.



If your pet is to have chemotherapy, you need to understand the risks involved in use of these unlicensed and toxic drugs. The safety precautions required to protect yourself, other people and the environment when handling and disposing of the drugs will be explained if you consent to their use.

How will I know how the cancer will behave?

Histopathology will give your veterinarian the diagnosis that helps to indicate how it is likely to behave. The veterinary pathologist usually adds a prognosis that describes the probability of local recurrence or metastasis (distant spread).

When will I know if the cancer is permanently cured?

'Cured' has to be a guarded term in dealing with any cancer.

Without treatment, dogs have an average life expectancy of ten weeks but a few live six to twelve months. Survival with the intestinal form is only eight weeks. Older dogs tend to survive longer than younger dogs. Chemotherapy remissions of up to a year are not uncommon in dogs but depend on the type and stage of the cancer at diagnosis.

Without treatment 40% of cats are dead within four weeks and 75% eight weeks following diagnosis. The average survival time with chemotherapy is 3.5 months for virus positive cats and 5 months for non-viral infected cats.

Lymphoid cancer in the chest, tonsil or bone marrow, blood or multiple organs often progress more rapidly than those only present in lymph nodes or a single organ.

Are there any risks to my family or other pets?

Feline leukemia virus can cause cancers of both the blood and lymphoid system. The virus is occasionally transmitted from an infected queen to her kittens before birth but is more commonly acquired from close contact with infected cats, which shed the virus in saliva, urine and feces. If your cat is infected, he or she can pass the infection to other cats. The infection is not transmissible to people. Similarly feline immunodeficiency virus, which is similar to HIV in people only affects cats and cannot infect people or other animals such as dogs.

This client information sheet is based on material written by Joan Rest, BVSc, PhD, MRCPath, MRCVS.