

Lymphoid and Hematopoietic Tissue Tumors

- Lymphoid Tissue Tumor

Lymphoma

(Lymphosarcoma)(=Malignant lymphoma)

- Hematopoietic Tissue Tumors

Myoproliferative Disorders

Lymphoma

- They are classified in five groups according to their **anatomical location**;

- Multicentric lymphoma
- Thymic lymphoma
- Alimentary lymphoma
- Dermal lymphoma
- Solitary lymphoma

- **Cytologically**, lymphosarcomas are classified as follows;

- Stem cell type (undifferentiated)
- Histiocytic type (reticulum cell)
- Lymphoblastic type (lymphocytic, less differentiated)
- Lymphocytic and proliferative type (well differentiated)
- Hodgkin-like type

Lymphoma

(dog)

- It is a common tumor in dogs.
- Approximately 10% of tumor cases occur between 1-4 years, 80% between 5-11 years. The incidence decreases at older ages. Boxer breed is more sensitive than other races.
- The time between diagnosis and death of the tumor is 10 weeks in multicentric form and 8 weeks in alimental form. Dogs with lymphosarcoma over 12 years can live for a long time.

- Clinical findings *vary* according to *tumor type*.
- Bilateral - symmetric growth (normally 3 to 10 times) is noted in superficial lymph nodes in **multicentric form**.
- The cortex-medulla can not be distinguished on cut surfaces and it is pink-gray or cream color.
- In addition, **edema** is seen in lower jaw, leg, external genital organs, ventral sternum.
- Liver, spleen and even kidneys can grow diffusely or with multiple nodules.

Lymphoma

(dog)

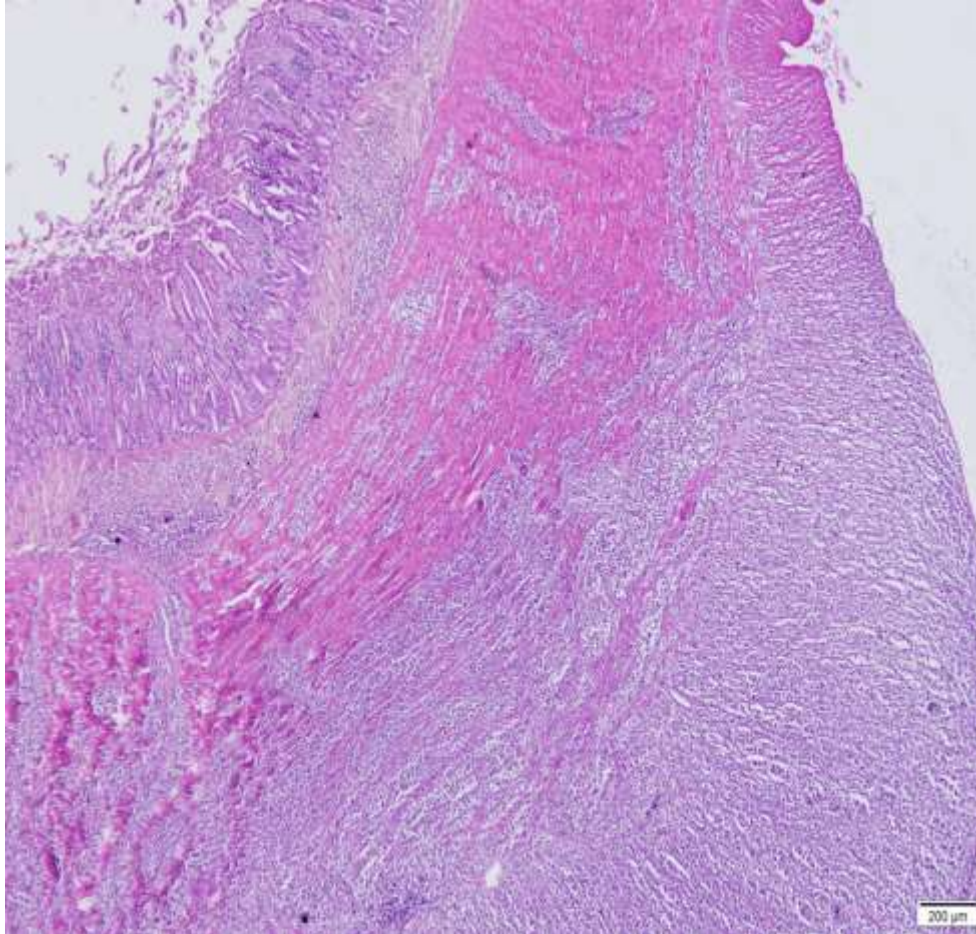
- In the **alimentary form**, gastrointestinal tract obstruction, diarrhea and vomiting may develop.
- Growth of superficial lymph nodes and spleen are rarely seen.
- Microscopically; Polymphocytic, histiocytic, and lymphoblastic cell types *proliferate to close lymph node's general structure*.
- Similar cell proliferation can also be seen in the liver, kidney, lung, and intestine.

Lymphoma

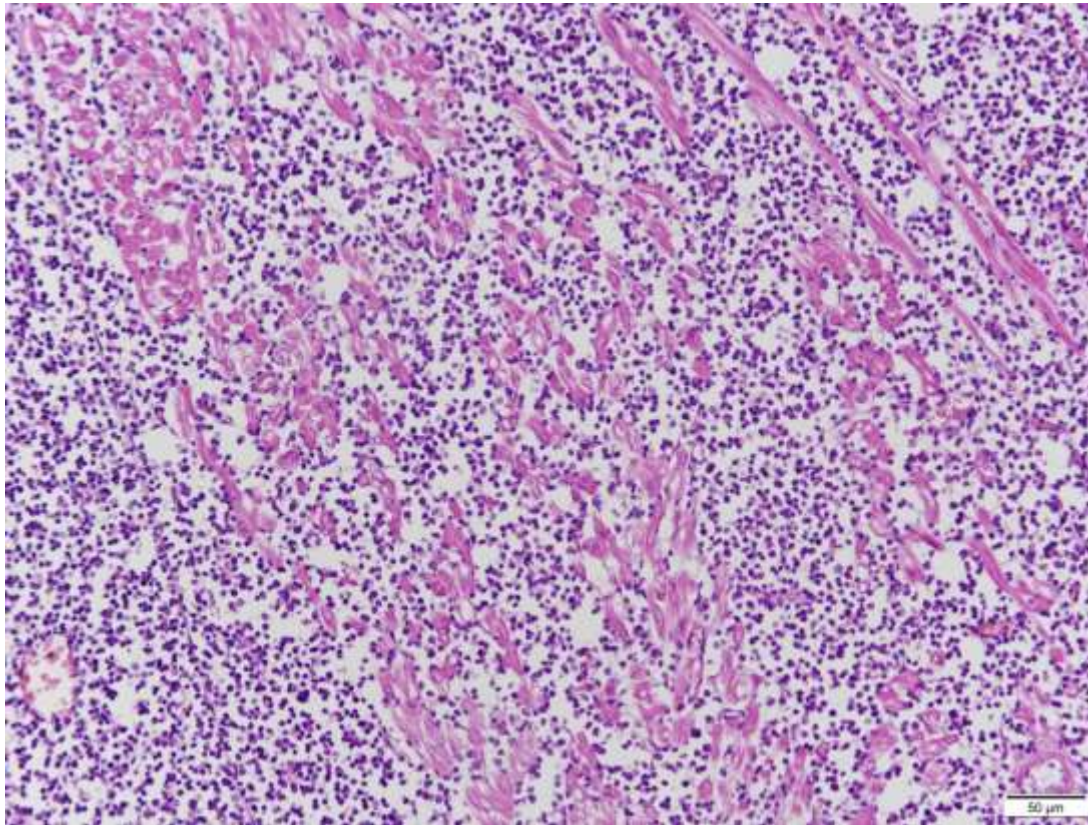
(cat)

- It is the most common tumors.
- 50% of the cats with tumors are under 5 years of age (tumors may develop even in 6 months of age).
- The male cat is more sensitive than female ones.
- In cats, the agent of lymphosarcoma is a **retrovirus** (Feline Leukemie Virus-FeLV).
- The most common type in cats is **alimentary type**.
- It is followed by thymic, multicentric, leukemic and solitary types.





- Lymphosarcoma, intestine, cat, Hx&E.



- Lymphosarcoma, intestine, cat, HxE.

Bovine leukosis

- This disease, which is seen in many parts of the world and in our country, is actually a **Lymphoma**
- It is seen as Sporadically in youngs, Enzootically in olds.
- The agent of Enzootic leukosis is "**Bovine Leukemia Virus**" of **retrovirus**.
- It is seen mostly in 5-8 years of age, there is growth in superficial lymph nodes in multicentric form.

Bovine leukosis

- The location of the tumor may vary according to the age of the animal.
- In young cattles (6-30 months), mostly *thymic form* is observed. Also, multicentric form, which also affects the hemopoietic tissue, is seen.
- In such animals, growth can occur in all lymph nodes, with extensive infiltrations in the bone marrow, and about half of the cases lesions can be observed in the thymus, heart, liver, spleen, kidneys and uterus.

Bovine leukosis

- In the aged animals, mostly multicentric form is found. Lymph nodes, heart, abomasum, kidneys, uterus, epidural fat tissue of the medulla spinalis, intestines, liver and spleen are the most affected areas.
- In the less common skin form, nodules develop in the head, neck, trunk and perineal region, but can be regressed with time.

HEMOPOIETIC TISSUE TUMORS

Myoproliferative Disorders

This term is used to describe the persistence and irreversible proliferation of more than a half of the elements in the bone marrow. It is a rare neoplastic lesion that can be seen in animals.

Granulocytic leukemia
Monocytic leukemia
Erythroleukemia
Erythraemic myelosis
Polycythemia vera
Megakaryocytic leukemia
Idiopathic
Thrombocythemia
Myelofibrosis

TERATOMA

- Teratomas are embryonal tumors that arise from germ cells. They are defined as being composed either of tissues that derive from all three of the germ layers (*ectoderm, endoderm and mesoderm*).
- A **teratoma** is a tumor made up of several different types of tissue.
- These tumors contain **hair**, **nerveous tissue**, glandular or epithelial lining of **bronchi**, **intestinum**, etc...

TERATOMA

- Teratomas are more common in the ovaries, testes, pharynx and sacrum of horses.
- It has been reported that one of four cases in horses are seen in cryptorchidic testes.
- Tumor macroscopically; round-oval, irregularly shaped, encapsulated or non-encapsulated. There may be cystic structures on the cross section.
- The teratomas in animals, unlike those in humans, are mostly benign. It can be taken by operation. However, it can sometimes metastasize by acquiring malignancy.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- Also called as Venereal granuloma, Sticker sarcoma, Histiocytoma, Contagious venereal tumor, Lymphosarcoma.

How old is CTVT?

- CTVT first emerged in a dog that lived about 11,000 years ago. All CTVT tumours carry the DNA belonging to this “**founder dog**”.
- By counting and analysing the mutations acquired by CTVT tumours around the world we can piece together how and when CTVT emerged and spread.
- CTVT is thus **the oldest cancer** known in nature.



Artist's impression of the “**founder dog**” that first gave rise to CTVT. This dog's phenotypic traits were interpreted from the genetic variation found in the DNA of the cancer that it spawned. [Image credit: Emma Werner]

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- The cellular origin of the tumor **is not exactly known**. It was thought to originate from cells such as *lymphocytes, histiocytes, reticulum cells*, but the exact origin could not be determined.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- CTVT is spread by the physical transfer of living cancer cells between dogs.
- The tumor can be transmitted by coitus directly through living tumor cells transplantation.
- CTVT may also be transferred by licking, sniffing or parturition.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- Macroscopically; masses are in cauliflower appearance, sometimes with stalk, nodular, multilobulated, friable, hemorrhagic.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- It is 0.5-10 cm in size, the surface may become **ulcerated** and secondary infections may develop. The tumor is formed in the vulva and vagina in female dogs and in the penis and preputium in male dogs. Sometimes, it can develop on the skin.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- Tumor cells are uniform, round, oval or polyhedral.
- It has a hyperchromatic-large nucleus and has eosinophilic cytoplasm.
- Tumor cells arranged or grouped in *cords* interspersed with a thin connective stroma.
- Mitotic figures are common.
- Necrosis and hemorrhage may be seen in the tumor.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- The CTVT cells have fewer chromosomes than normal cells. Dog cells normally have 78 chromosomes; The cancer cells contain 59 ± 5 chromosomes.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- Metastasis is rare. However, metastases may be seen in the inguinal (male and female) and iliac (female) lymph nodes, spleen, kidneys, liver, eye, brain, pituitary, skin, mesenteric lymph nodes and peritoneum.
- **Extragenital lesions** have been reported to occur both in isolation and in association with the genital lesions.

CANINE TRANSMISSIBLE VENEREAL TUMOR (CTVT)

- The tumor was treated weekly with intravenous *vincristine*.
- Dramatic reduction in tumor size occurs after the first dose.