

## USEFULNESS OF COMPUTED TOMOGRAPHY IN THE DIAGNOSIS OF MULTICENTRIC LYMPHOMA- A CASE REPORT

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**Abstract:** The purpose of this study is to describe the CT (computed tomography) findings as an added tool in the diagnosis of multicentric lymphoma in a 5-year-old female Labrador retriever weighing around 27 kg. The animal was presented in the Small Animal Medicine outpatient unit of Madras Veterinary College with a history of inappetance, generalized lymphadenopathy and impaired vision. Radiography, ultrasonography along with fine needle aspiration cytology (FNAC) of the lymph node were suggestive of lymphoma. A CT scan performed on the patient under mild anaesthesia revealed major changes in the spleen and other abdominal organs confirming multicentric lymphoma. CT has an advantage over conventional X ray as we are able to get cross sectional images of internal organs for better evaluation which was not possible in the previous one due to superimposition.

**Keywords:** Computed Tomography scan, multicentric lymphoma, lymphadenopathy, Radiography.

### Introduction

Lymphoma is a type of malignancy involving the lymphocytes. It is the one most common canine hematopoietic neoplasm, accounting for nearly 7% to 24% of all canine neoplasms (Zandvliet, 2016). Classification of lymphoma is done based on the anatomic location and histological criteria (Aptekmann *et al.*, 2005). Multicentric form is one of the most common presentations of canine lymphoma. Multicentric lymphoma is characterized by generalized lymphadenopathy with or without involvement of spleen, liver and bone marrow (Jones *et al.*, 2017). Splenic lymphoma is often reported as diffuse dissemination characteristic of Hodgkins and Non-Hodgkins lymphoma (Li *et al.*, 2013). Ultrasonography and CT are the major diagnostic modalities for staging of haematopoietic malignancies. In small animal practice, Computed tomography (CT) has been thought to be the most precise tool for abdominal imaging and staging of lymphoma (Tanaka *et al.*, 2019), however CT has not been used extensively in evaluation of splenic lymphomas. While barium enhanced radiography or endoscopy helps in diagnosing intra luminal lesions in the abdomen, CT has the advantage that it provides additional information pertaining to lesions bound to the border

of the lumen (Yasuda *et al.*, 2004). Monitoring response to therapy is a proven use of CT in lymphoma patients.

### **History and Clinical Examination**

A 5-year-old female Labrador retriever weighing around 27 kg with a history of generalized lymphadenopathy, inappetance and loss of vision for the past 15 days was presented in the small animal outpatient unit of Madras Veterinary College. Ophthalmic examination revealed the absence of menace and pupillary reflexes on both eyes. On palpation, all peripheral lymph nodes were enlarged.

Blood and serum samples were collected for analysing the haematological and serological parameters. Haematogram revealed hypochromasia and relative neutrophilia, whereas no changes were observed in the serum biochemistry profile except for the mild elevation in the ALP values. Ultrasonography revealed hepatomegaly, splenomegaly with enlarged mesenteric lymph nodes. Radiography of the thoracic and abdominal view revealed intra-thoracic mass, bronchial pattern of the lungs and sub lumbar lymph node enlargement respectively. Fine needle aspiration biopsy was taken from left popliteal lymph node and confirmed as lymphoma on cytological examination. PARR assay and immunohistochemistry were confirmative for T cell lymphoma. PARR assay revealed T cell clonalization and moderate expression of CD3+ and negative expression of CD79a were observed in immunohistochemistry.

### **Diagnosis and treatment**

Following a 12 hr fast, a whole body CT scan was performed on the animal with the help of Toshiba Alexion CT scanner. The animal was placed in the gantry opening of the CT scanner. CT scan procedure was done under General anaesthesia using Inj. Propofol @ 4mg/kg and maintenance with Isoflurane inhalation anaesthesia. TOSHIBA CT Alexia 16 slice was used for the study. 5 mm slice thickness, ME 100 kVp 120 and window length 380 and window 40 factor were visualized for CT study. CT slices were made in sternal recumbency of the animal. Axial, Coronal and saggital planes, multiplanar reconstruction and 3D reconstruction software were used for the study of Lymphoma. Hypoattenuating nodules and homogenous enlargement were seen within the liver, hyperattenuating mass were seen in parenchymal region in dorsal and ventral abdomen. In skull CT, retropharyngeal lymphnodes and mandibular lymphnodes were enlarged. These findings correlate with the earlier findings. Homogenous enlargement of the spleen was appreciable having diffuse infiltration. Metastases is evaluated as hypoattenuating nodules or masses distributed throughout the

parenchymal region (Fig 1). This correlates with diffuse hypoechogenicity indicating lymphoma (Nerschbach *et al.*, 2016).

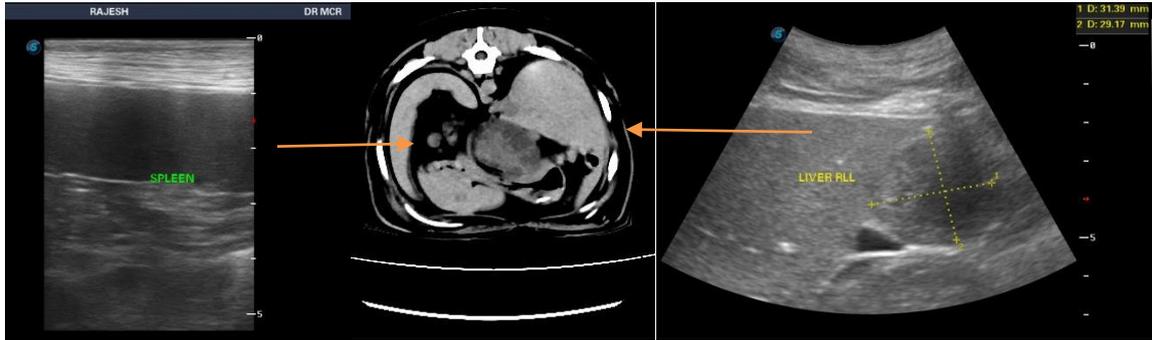


Fig1. a) Ultrasonography of spleen, b) CT scan of abdomen depicting enlarged spleen and liver and c) ultrasonography of liver

The gastric wall is markedly thickened as observed in ultrasonography, having mural thickening and calcification. The mesentery is isointense (Fig 2).

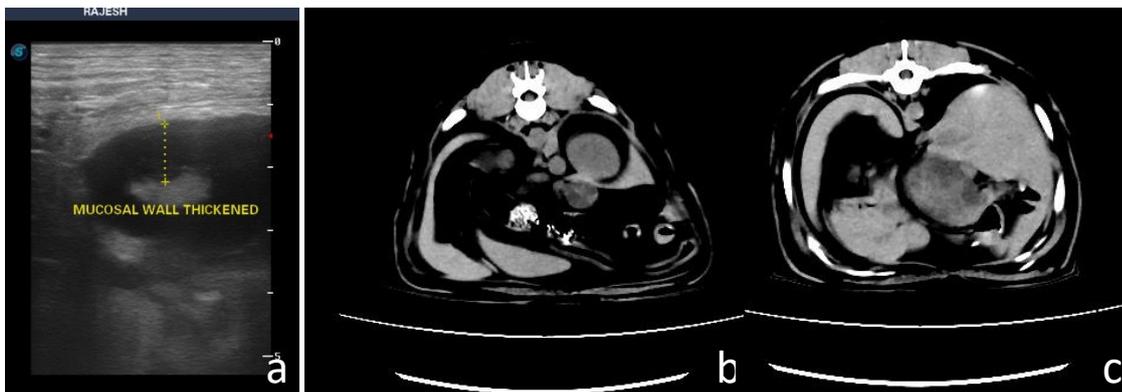


Fig 2. a) Ultrasonography of abdomen depicting thickened mucosal wall, b) & c) CT scan of abdomen featuring abdominal organs, depicting enlarged spleen and liver.

The gastric wall is markedly thickened as observed in ultrasonography, having mural thickening and calcification. The mesentery is isointense.

Chemotherapy was administered by following the 25 week CHOP therapy (Wisconsin – Madison protocol). The animal developed partial seizures, lethargy, inappetance and vomiting. Fluid therapy was administered such as Ringer's lactate. Ondansetron and Pantaprazole was given to the patient to treat vomiting. As the symptoms persisted, the animal was euthanized upon the owners's request.

## Discussion

Recent advancements in the diagnostic methodology has made more prompt assessment of lymphoma. Diagnosis of liver and splenic lymphoma based on the radiography studies alone

can result in false positive judgement. (Nerschbach *et al.*, 2016). Computed tomography gives additional information in staging malignant diseases in canine. (Seiler *et al.*, 2015). Changes on the liver parenchyma due to lymphoma is quite challenging with Radiographic and ultrasonographic diagnosis. CT scan study of liver is helpful in identifying the hepatic lymphoma well in advance. This particular case showed the involvement of liver, spleen and mesenteric lymphnodes. This helped us assessing chemotherapeutical response also. In conclusion, this case describes the relative benefits of CT in veterinary practice in particular, in the diagnosis of canine lymphoma. The application of the CT imaging in the diagnosis of splenic, mesenteric lymphoma is appreciable and novel. Further inclusion of these diagnostic procedures will help in decision making procedure. This will enable us in arriving at the right diagnosis, conclude the right prognosis pertaining to canine lymphoma and necessitate treatment in the form of chemotherapy and further evaluation of the response to therapy. CT investigation threw light on the involvement of liver and spleen and further ascertaining stage/grade of lymphoma and also subjecting the cases to CT scan before and after chemotherapy will aid in the assessment of regression of the mass. In this study we were able to stage the lymphoma as multicentric stage IV<sub>a</sub> as per WHO guidelines. The dog was treated using a combination of chemotherapeutic agents as per the Madison Wisconsin University protocol. This CT scan study was utilized in one single case. Hence if we use CT scan to study more number of cases, we will be able to derive more accurate information even up to minute level.

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