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GASTRIC LYMPHOMA IN A DOG: CASE REPORT

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Abstract: Lymphoma is a malignant lymphoid neoplasm, originating from hematopoietic cells, of rapid and aggressive evolution, which mainly affects the lymph nodes and other solid visceral organs, such as the liver, spleen, stomach and intestine. Gastric neoplasms represent less than 1% of all canine tumors and have a higher prevalence in males. Alimentary lymphoma is a malignant tumor, characterized by neoplastic involvement of the gastrointestinal tract, mainly the stomach and small intestine and/or the mesenteric lymph nodes. Most clinical signs are nonspecific. The diagnosis of lymphoma is based on anamnesis, complete physical examination, complementary tests, tissue diagnosis and clinical staging. Cytological examination is important, however histopathological examination is recommended as it is conclusive. Contrast-enhanced X-ray and endoscopy are the methods of choice in the diagnosis of alimentary lymphoma. There are numerous chemotherapy protocols that act against lymphoma. The Winconsin-Madison chemotherapy protocol presents excellent results, as most dogs present good remission of the clinical condition. This protocol is formed by L-asparaginase, vincristine, cyclophosphamide, Methotrexate and doxorubicin. Despite being a disease that has no cure, it provides good quality of life and has a high percentage of complete, temporary remissions. Some factors are of great importance for determining the prognosis and helping to choose the protocol, such as clinical staging, anatomical location of the tumor, histological classification, mitotic index, presence of hormone receptors, initial response to chemotherapy, presence of paraneoplastic syndromes, invasiveness, immunophenotyping, age, species, breed and sex of the animal. The objective of this work is to report a clinical case of a young dog diagnosed with gastric lymphoma and treated with an adaptation of the Winconsin-Madison chemotherapy protocol.
Keywords: Leukemia. Neoplasm. Canine. Stomach. Wisconsin-Madison.

INTRODUCTION

Lymphoma is a malignant lymphoid neoplasm, originating from hematopoietic cells, of rapid and aggressive evolution, which mainly affects the lymph nodes and other solid visceral organs, such as the liver, spleen, stomach and intestine, and in some cases can invade the bone marrow and circulate in the blood, resulting in myelosuppression. (JONES, 2000; FIGHERA; SOUZA; BARROS, 2002; CARDOSO et al., 2003; CARDOSO et al., 2004; ROSENTHAL, 2004; MORENO; BRACARENSE, 2006; NELSON; COUTO, 2006; MORRIS; DOBSON, 2007; ARAUJO et al., 2008; VALL, 2008; CAPUA et al., 2009; WIKIPÉDIA, 2009).

Lymphoma starts from the neoplastic transformation, which occurs from damage to the DNA of a lymphocyte, generating a malignant alteration and subsequent proliferation of the lymphocyte that grows uncontrollably in solid lymphoid organs, generating tumor masses. A defect in the identification of neoplastic cells allows these cells to multiply, and for this reason this neoplasm is not considered hereditary. Lymphoma can develop in several sites at the same time or originate in one site and progress to others without metastasizing. An animal with low immunity may be more predisposed that its defense cells do not identify neoplastic cells. (MORRIS; DOBSON, 2007).

Lymphoproliferative disorders and lymphomas are staged using tissue and organ involvement criteria. The anatomical classification of the WHO considers the organs and tissues infiltrated by the tumor cells, being A - generalized, multicentric, B - digestive, C - thymic or anterior mediastinal, D - skin or

cutaneous, E - leukemia involving only blood and bone marrow and F – several (ETTINGER, 1992). Anatomically, lymphomas are classified as multicentric, mediastinal, alimentary, cutaneous and extranodal (SEQUEIRA et al., 1999; FIGHERA; SOUZA; BARROS, 2002; CARDOSO et al., 2003; MORENO; BRACARENSE, 2006; MORRIS; DOBSON, 2007; ARAUJO et al., 2008; SUZANO; SEQUEIRA; ROCHA, 2008). The multicentric form is the most common in dogs, while the alimentary and mediastinal forms are more common in cats (ARAUJO et al., 2008).

Alimentary lymphoma is a malignant tumor, characterized by neoplastic involvement of the gastrointestinal tract, mainly the stomach and small intestine, and/or the mesenteric lymph nodes (ETTINGER, 1992; FIGHERA; SOUZA; BARROS, 2002; CARDOSO et al., 2003; CARDOSO et al., 2004; MORENO; BRACARENSE, 2006; NELSON; COUTO, 2006). Gastrointestinal lymphoma typically does not affect the superficial lymph nodes and spleen, unlike multicentric lymphoma, in which these structures are usually affected (COYLE; STEINBERG, 2004).

Of the gastrointestinal tumors, the occurrence in the stomach is greater than in the esophagus, intestine, perianal, liver and exocrine pancreas, in dogs. The early diagnosis of these gastrointestinal neoplasms does not always occur, as the first signs of the neoplastic process are often confused with nonspecific signs of digestive disorders (SOBRAL et al., 2008).

Gastric lymphoma can arise in any area of the stomach, as a single or diffuse lesion, and mucosal ulceration is common (STANTON, 1996). According to Morris and Dobson (2007) and Sobral et al. (2008), lymphoma produces a diffuse thickening of the gastric wall, usually non-ulcerated, without cirrhotic appearance. (RODULFO; ORTEGA; LAPARRA, 2007). Gastric lymphoma lesions can be multiple or extend to intestinal segments, with or without the involvement of other abdominal organs (SOBRAL et al., 2008).

Lymphoma has an incidence of thirteen to 33 cases per hundred thousand dogs per year (FIGHERA; SOUZA; BARROS, 2002; COYLE; STEINBERG, 2004; MORENO; BRACARENSE, 2006; MORRIS; DOBSON, 2007; SUZANO; SEQUEIRA; ROCHA, 2008). Gastric neoplasms are rare in dogs, accounting for less than 1% of all canine tumors (DUNN, 2001, ROSENTHAL, 2004;). It is known that approximately 30% of gastric tumors are benign and that gastric lymphoma is more common in cats than in dogs, the latter being, in most cases, elderly animals, with a mean age of 9 years (STANTON, 1996; DUNN, 2001). Lymphoma is the most common gastric neoplasm in cats, which are usually negative for feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV) (STANTON, 1996; FIGHERA; SOUZA; BARROS, 2002; ROSENTHAL, 2004; MORRIS; DOBSON, 2007; ARAUJO et al., 2008). The races at greatest risk are the Orientals (MORRIS; DOBSON, 2007).

Clinical staging, anatomical distribution, histological classification of the tumor, anatomical site of origin of the tumor, age of the animal, species, breed, sex, mitotic index, presence of hormone receptors, histological classification of the tumor, invasiveness, immunophenotype, initial response to chemotherapy and hypercalcemia are factors that determine and influence the prognosis (ETTINGER, 1992; MORENO; BRACARENSE, 2006).

The most common signs in dogs with alimentary lymphoma are vomiting, diarrhea, anorexia, weight loss, dyschezia and tenesmus. Clinical signs of peritonitis secondary to complete bowel obstruction and rupture may be present, but occasionally. It is common for digestive lymphomas to be accompanied by

hepatomegaly and splenomegaly (SEQUEIRA et al., 1999; CARDOSO et al., 2004). Fever may be present in some dogs with digestive lymphoma, especially those with secondary infections (CARDOSO et al., 2004).

The diagnosis of gastric lymphoma is made from radiography (RX) with contrast (STANTON, 1996; MORRIS; DOBSON, 2007; SOBRAL et al., 2008) and gastroduodenoscopy (SOBRAL et al., 2008). During this last examination, samples of fragments of the visualized lesions must be collected, and later they are sent for biopsy by histopathological examination, and it is the examination that will conclude the definitive diagnosis (ETTINGER, 1992; STANTON, 1996; DUNN, 2001; CARDOSO et al., 2003; ROSENTHAL, 2004; MORRIS; DOBSON, 2007; SOBRAL et al., 2008; VALL, 2008).

In most animals, the disease is diagnosed when they reach grade III, IV and V of the disease, when they already have signs of compromising the disease in an advanced degree. This occurs due to the delay in the manifestation of clinical signs, the referral of the animal to the veterinarian and the identification of the disease, causing the progression of the disease, worsening the prognosis, making treatment difficult and reducing survival (SEQUEIRA et al., 1999; CARDOSO et al. al., 2003; MORENO; BRACARENSE, 2006).

Lymphoma is the only gastric tumor that responds well to systemic chemotherapy (MORRIS; DOBSON, 2007), which is the main treatment indicated (COYLE; STEINBERG, 2004; NELSON; COUTO, 2006; SOBRAL et al., 2008; CÁPUA et al, 2009). The University of Winconsin-Madison chemotherapy protocol (L-asparaginase, vincristine, cyclophosphamide, and doxorubicin) is a variation of the CHOP protocol (cyclophosphamide, vincristine, and prednisone). Despite being quite complex, it presents excellent results in the treatment of alimentary lymphoma, since most dogs present good remission of the clinical picture (ARAUJO et al., 2008; VALL, 2008).

Chemotherapy helps to prolong and improve the animal's quality of life (ROSENTHAL, 2004), but cures are rare. Symptomatic clinical treatment, associated with chemotherapy, with antiemetics, H2 receptor antagonists and proton pump inhibitors, is of great importance, as it improves the quality of life of animals during the survival period (SOBRAL et al., 2008).

Gastric lymphoma is characterized by low survival rates (MORRIS; DOBSON, 2007). And the diffuse food type is commonly associated with a worse prognosis than the localized one (MORENO; BRACARENSE, 2006).

The average survival of dogs treated with the Winconsin-Madison protocol is from ten to twelve months (ARAUJO et al., 2008; VALL, 2008), and can reach a survival of approximately two years (DALECK; CALAZANS; NARDI, 2008). Dogs without treatment have an average survival of six to eight weeks (CARDOSO et al., 2004; MORRIS; DOBSON, 2007). When the tumor reappears, less than half of dogs respond to "rescue therapy". It is then necessary to resort to "rescue therapy" that uses drugs not previously prescribed. Therefore, the objective of this work is to report a clinical case of a young dog, three years old, diagnosed with gastric lymphoma and treated with an adaptation of the Winconsin-Madison chemotherapy protocol, which increased the dog's life expectancy., with quality.

CASE REPORT

This clinical case is of a female Dobermann dog, castrated, who arrived at her first consultation at three years and five months old, weighing 29.5 kg. Four months ago, the animal began to present frequent diarrhea and vomiting and was being treated by another veterinarian. The dog had been diagnosed with Demodicosis three years ago. The vomit sometimes had a paste-like appearance and at other times it was liquid and yellowish. And episodes of diarrhea with soft, gelatinous-looking stools and watery, blackened diarrhea.

The tutor reported that the animal always had the habit of eating plants and vomiting afterwards. The bitch showed appetite, but had dysphagia and vomited shortly after feeding. In recent months the animal has lost approximately five kilograms. Feeding is based on animal feed and sometimes with rice and chicken meat. He had normodipsia and normouria. The tutor also noticed that when he palpated the animal's abdomen, it was in pain.

The previous veterinarian had performed several different treatments and ordered a series of tests. A parasitological examination of feces (EPF) was carried out, which indicated the presence of Dipyllidium caninum, a blood count, blood cytozoan research and a biochemical analysis, and the results did not show alterations. Besides, an ultrasound examination (US) in which the result was a suspected intestinal foreign body and an abdominal radiograph (RX) that did not show significant changes, only the presence of gas in the intestine. Treatments with Flagyl, Metronidazole, Pankreoflat®[1], Azium, Vegetal Charcoal, Mineral Oil, Plasil and Ornitargin®[2] were prescribed, where the animal showed some clinical improvement, but at the time of that consultation it had a worsening in the condition.

The clinical examination revealed a thin and slaughtered animal, rectal temperature of 39.3°C, normocolored oral and ocular mucous membranes, normohydrate, capillary perfusion time (CPT) in less than two seconds, cardiac and pulmonary auscultation without alteration, heart rate (HR) of 140 beats per minute (bpm), respiratory rate of 28 movements per minute (mpm), synchronous pulse, normokinetic, enlarged popliteal lymph nodes and abdominal pain.

A new abdominal US, a contrast-enhanced abdominal X-ray, a blood collection for a blood count and biochemical analysis (creatinine, ALT, albumin and amylase) were performed, and a gastroduodenoscopy was scheduled for the following week. At US, a hypoechogenic mass was visualized, measuring 4.6 cm by 4.2 cm in diameter, with a wall thickness measuring 1.2 cm, in the topography of the epigastric region, leading to the suspicion of mural neoplasia. The pancreas was hypoechoic, approximately 1.6 cm thick, an image compatible with pancreatitis. The other abdominal regions did not show visible echographic alterations. On the contrast-enhanced X-ray, radiopaque masses appeared on the stomach wall, on the greater curvature of the stomach and in the pyloric region, between the stomach and the liver (Figure 1). There were no alterations in the blood count and in the biochemical analysis, the serum albumin level was decreased (21.1 g/L, with reference value - RV between 26-33 g/L), amylase was increased (919.5 U/L, with a RV lower than 700 U/L) and other results within the reference values. The diagnosis based on complementary exams was gastric tumor

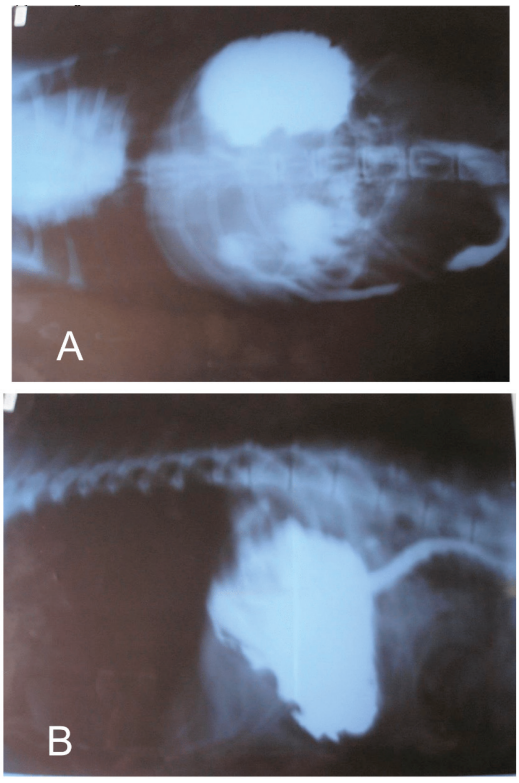

Figure 1 – Contrast abdominal X-ray image of the bitch, ventro-dorsal position (A) and lateral-lateral position (B), showing radiopaque masses in the stomach wall, in the greater curvature of the stomach and in the pyloric region.

Source: Goltz (2021)

On the day of gastroduodenoscopy, venoclysis and infusion of Ringer Lactate were performed, prior to sedation. Morphine (0.5 mg/kg, IM) and Propofol (6 mg/kg, IV) were used as pre-anesthetic medication (MPA).

During the examination, no esophageal alterations were seen (Figure 2), however, the presence of multiple elevations of varying sizes, with irregular edges, spread throughout all regions of the stomach (Figure 3), mainly in the region between the body and the pyloric antrum. In the area close to the cardia there were fewer lesions than in the rest of the stomach. The image is suggestive of an intramural tumor.

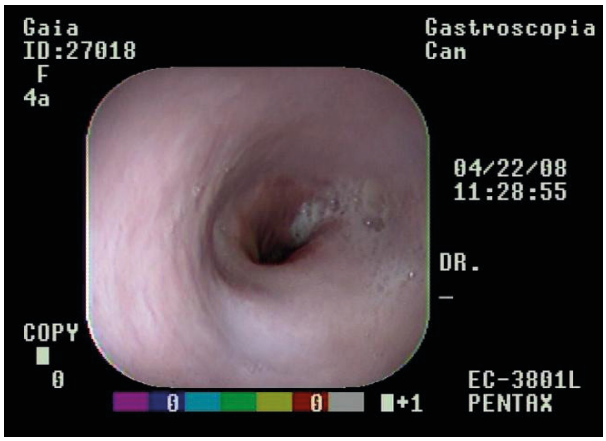

Figure 2 – Gastroduodenoscopy in the abdominal portion of the bitch's esophagus, viewing the cardia region, where the absence of lesions is observed.

Source: HCV (2021)

During the procedure, fragments of gastric tissue were collected and sent for cytological analysis and biopsy. At the end of the examination, material was also collected from the right popliteal lymph node by FNAB (fine needle aspiration biopsy) for cytological analysis.

In the cytological examination of the lymph node BAAF, small and medium-sized lymphocytes, plasmocytes, some segmented neutrophils and many erythrocytes were observed, compatible with a reactive lymph node. In the cytology of samples collected from the stomach, normal epithelial cells and irregularly shaped pleomorphic lymphoblasts, basophilic cytoplasm, nucleus with dense chromatin and presence of mucus were observed, a result suggestive of lymphoma.

In the histopathological examination of the stomach samples, a tumor mass located in the submucosa was observed, however infiltrated in the mucous, muscular and serous layers, with a high mitotic index, areas of necrosis and acute inflammation and composed of proliferation of blastic lymphoid cells with a moderate degree of pleomorphism cellular and nuclear, arranged in solid groups separated by

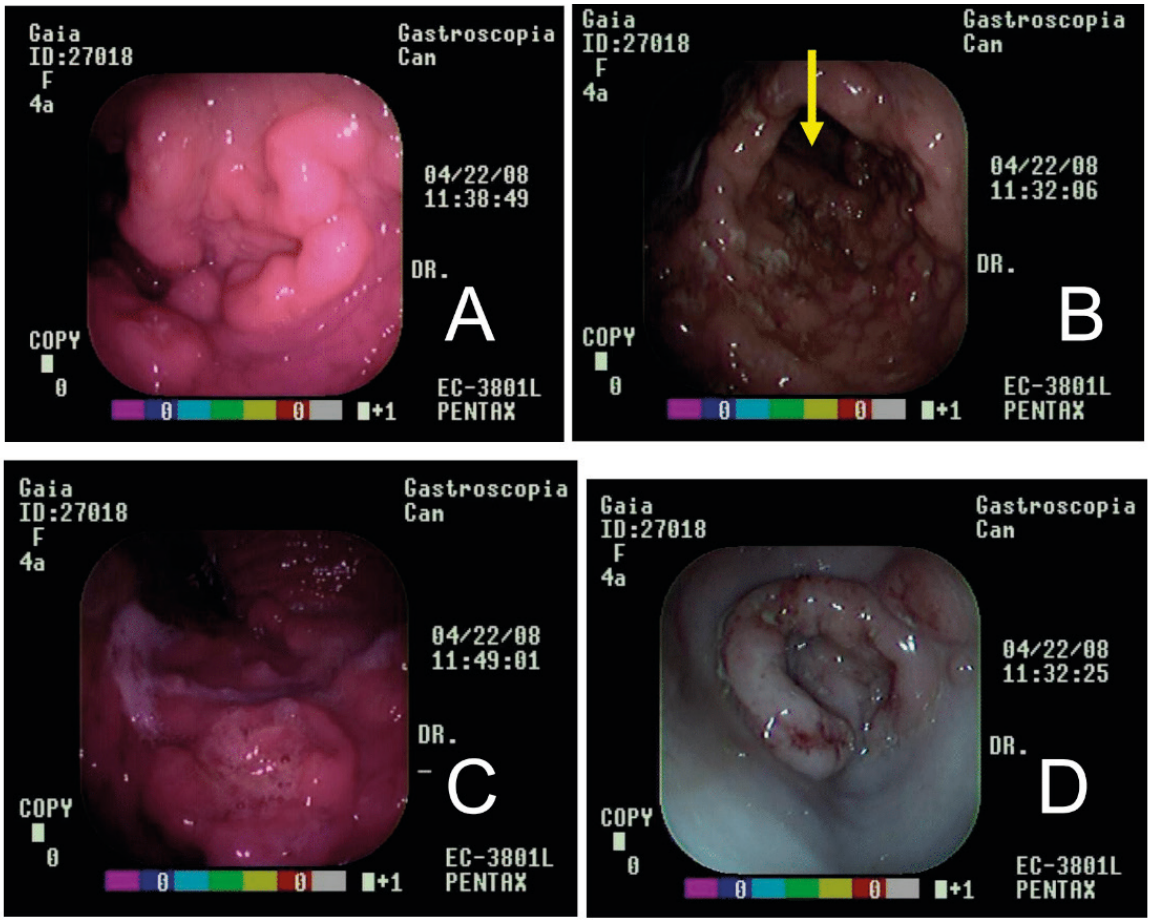

Figure 3 – Image, obtained from gastroduodenoscopy.

Source: HCV (2021) (A) Note the presence of multiple elevations of varying sizes and with irregular edges, spread throughout the dog's stomach. (B) Between the body and the pyloric antrum, the completely altered region is observed, covered by raised, irregular nodules and some with ulceration of the mucosa. The yellow arrow is pointing towards the pyloric antrum. (C) Visualization of the cardia region of the stomach where there are elevated and irregularly distributed nodules, but in smaller quantities than other locations in the stomach. (D) Image of the pylorus, where it is possible to observe the presence of sphincter thickening, with several areas of the ulcerated mucosa and the presence of raised nodules around it.

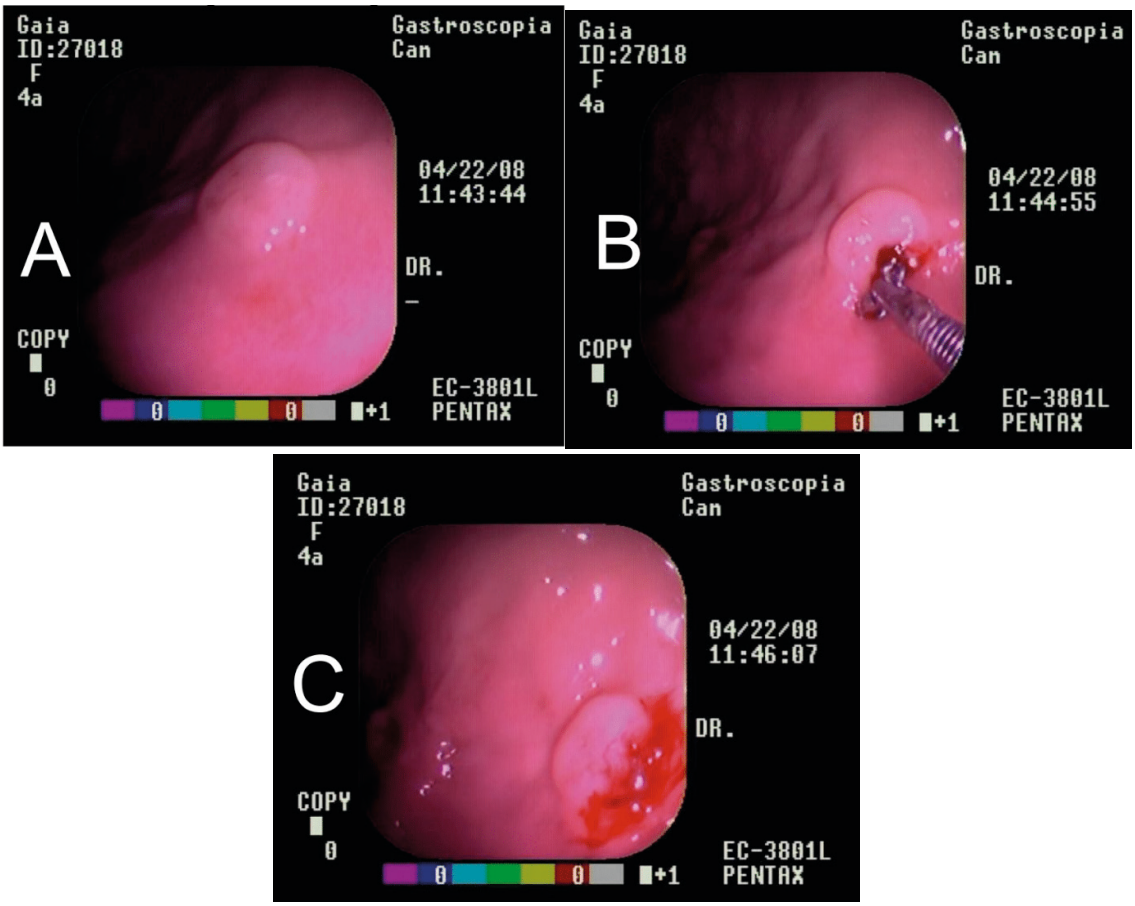

Figure 4 – Nodule images present in the bitch from which material was collected. In image "A" the nodule can be seen, before material was collected from it. Image "B" shows the moment of collection of a fragment. In image "C" local bleeding due to material collection is visible.

Source: HCV (2021)

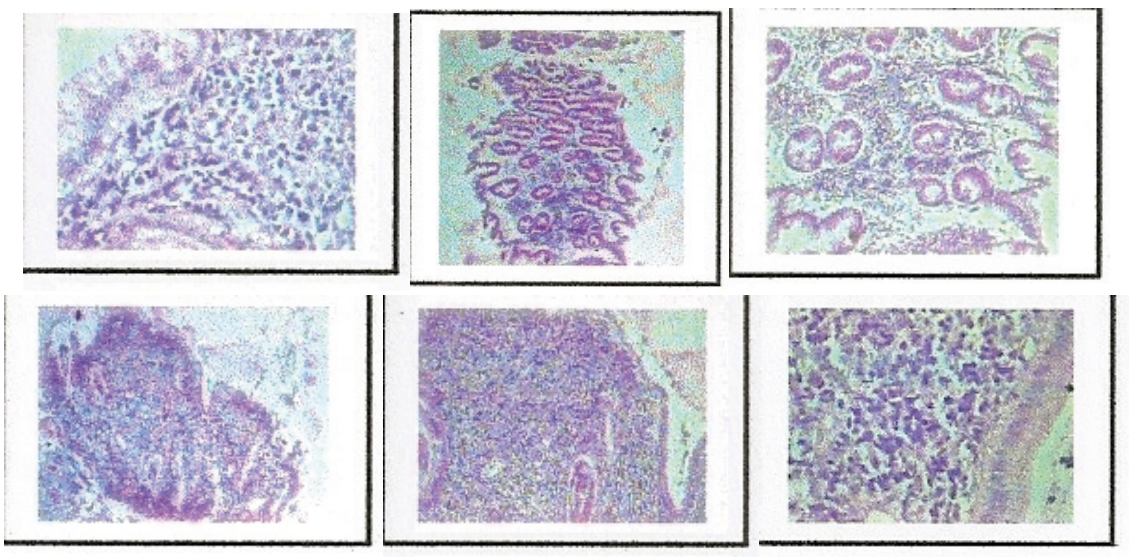

Figure 5 – Images of the microscopic description of the histopathological examination of the bitch.

Source: Laboratory: Pathos (2021)

connective septa (Figure 5). With the results of the complementary exams and the cytology and biopsy of the sample of material collected during the gastroduodenoscopy, the diagnosis of Gastric Lymphoma was concluded.

As therapy, the animal was prescribed Omeprazole (0.7 mg/kg, SID, for ten days, VO); Ranitidine hydrochloride (2 mg/kg, TID, for 15 days, PO); Metoclopramide (0.4 mg/kg, TID, PO, until further notice); Ondansetron hydrochloride (0.1 mg/kg, BID, for seven days, PO). The animal was referred for chemotherapy, for treatment following the Madison-Wisconsin Protocol (Table 1). Chemotherapy medications are calculated according to the animal's body area, in m^2, using the standard table for converting animal weight (in kg) to body area (in m^2).

Two days after the first chemotherapy session, an abdominal US was performed, where a hypoechoic mass was observed next to the right hepatic lobe, lateral to the stomach (on the right side), measuring approximately 5.3 cm x 4.4 cm. The gastric wall was thickened, measuring 0.7 cm thick.

In the second week of chemotherapy, the dog was in good spirits, with a good appetite, but continued to lose weight. The day before this consultation, the owner reported that the animal had liquid diarrhea, and as treatment, Sulfadiazine and Trimethoprim (20 mg/kg), BID, PO, were prescribed for 7 days.

In the third week of chemotherapy, the animal had an increase of 2.3 kg in weight. Tutor reported that he no longer had diarrhea. On this day, blood was collected for hemogram and biochemical analysis. The result of the hemogram was a reduction in lymphocytes, which were at 417/·L – 3% (VR = 1000 to 4800/·L) and an increase in segmented neutrophils 13205/L - 95% (VR = 3000-11500/L). In the biochemical analysis, ALT was increased to 125.7 U/L (VR <102 U/L).

In the fourth week, a new abdominal US was performed to control the evolution of the tumor and evaluate the functioning of the chemotherapy protocol. On examination, a hypoechogenic area of approximately 4 cm in diameter was visualized in the hepatic lobe, with poorly defined contours and a hypoechogenic nucleus. After three days, the animal returned for consultation, as it had thinning areas of hair on the chin and paws. A reduction to 1 mg/kg of Prednisone 20 mg SID, PO, continuous use was prescribed; Cephalexin 30 mg/kg BID orally for 20 days; recurring therapeutic baths and a monthly application of Advocate®[3].

In the fifth week, the vomiting stopped. After three weeks the dog returned for review, she was in good general condition, weighing 29.9 kg. Blood was collected for testing. The hemogram again showed decreased lymphocytes and the values of the biochemical analysis of renal (creatinine) and hepatic (ALT) functions returned to normal.

In the eighth chemotherapy session, an electrocardiogram was performed, with the objective of verifying if there was any cardiac alteration due to the chemotherapy. The result was sinus arrhythmia with axis deviation to the left, suggestive of right ventricular enlargement. On that day, Ranitidine Hydrochloride (2 mg/kg, TID, PO, for seven days) was prescribed; Metoclopramide (0.5 mg/kg TID, PO, for three days) and Brewer's Yeast (35 mg/kg, SID, PO, for 60 days).

In the ninth session, the animal presented a suppurative lesion on the right posterior limb. An abdominal US was performed for control. On examination, the liver was observed with homogeneous, normoechogenic parenchyma, with an irregular hyperechogenic spot, measuring approximately 3.9 cm x 2.9 cm in diameter in the right lobe. Image suggestive of fibrosis. In the stomach, the normal-thick wall was visible, with thick content. Due to the

WEEK	WEIGHT (kg) and BODY AREA (m^2)	MEDICINE	DOSE, ROUTE, PRESCRIPTION	COMPLEMENTARY EXAMINATION
1 - Day 1		L-asparaginase	(400 UI/kg) (10000 UI/m^2, SC)	
		Prednisone	2 mg/kg, SID, VO continuous use until further recommendations	
1 - Day 3	28 kg = 0,91 m^2	Vincristine	0,7 mg/m^2, IV	US
		Prednisone	2 mg/kg, SID, VO continuous use	
2	27,5 kg = 0,90 m^2	Cyclophosphamide	250 mg/m^2, VO	
		Prednisone	2 mg/kg, SID, VO continuous use	
3	29,8 kg = 0,94 m^2	Vincristine	0,7 mg/m^2, IV	Hg, bioq
		Prednisone	2 mg/kg, SID, VO continuous use	
4 - Day 1	29 kg = 0,93 m^2	Doxorubicin	30 mg/m^2, IV	US
		Promethazine	0,2 mg/kg, IM	
		Metoclopramide	0,4 mg/kg, SC	
		Ondansetron	0,1 mg/kg, IV	
		Prednisone	2 mg/kg, SID, VO continuous use	
4 - Day 3		Prednisone	1 mg/kg, SID, VO continuous use	EPP
5 – Day 1	29 kg = 0,93 m^2	Vincristine	0,7 mg/m^2, IV	
		Prednisone	1 mg/kg, SID, VO, continuous use	
5 - Day 3		Prednisone	0,5 mg/kg, SID, VO, continuous use	
6	29,5 kg = 0,93 m^2	Vincristine	0,7 mg/m^2, IV	
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
7	29,9 kg	Prednisone	0,5 mg/kg, SID, VO, continuous use	Hg, bioq
8	30 kg = 0,96 m^2	Doxorubicin	30 mg/m^2, IV	electrocardiogram
		Promethazine	0,5 mg/kg, IM	
		Metoclopramide	0,5 mg/kg, SC	
		Ondansetron	0,3 mg/kg, IV	
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
9	29,8 kg = 0,96 m^2	Vincristine	0,7mg/m^2, IV	US
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
10	29,8 kg = 0,96 m^2	Cyclophosphamide	250 mg/m^2, VO	electrocardiogram, Hg, bioq
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
11	29 kg = 0,93 m^2	Vincristina	0,7 mg/m^2, IV	
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
12	30 kg = 0,96 m^2	Doxorubicin	30 mg/m^2, IV	
		Ondansetron	0,3 mg/kg, IV	
		Prednisone	0,5 mg/kg, SID, VO, continuous use	
13	29,9 kg = 0,94 m^2	Vincristine	0,7 mg/m^2, IV	
		Prednisone	0,25 mg/kg, SID, VO, continuous use	
14	29,5 kg	Prednisone	0,25 mg/kg, every 48 h, orally, continuous use	
15	29,7 kg = 0,96 m^2	Vincristine	0,5 mg/m^2, IV	US, HG, bioq
		Metoclopramide	0,3 mg/kg, SC	
		Prednisone	0,25 mg/kg, every 48 h, orally, continuous use	

16	29,7 kg = 0,96 m²	Cyclophosphamide	100 mg/m², VO	
		Prednisone	0,25 mg/kg, every 48 h, orally, continuous use	
17	31,7 kg = 1 m²	Vincristine	0,7mg/m², IV	
		Prednisone	0,25 mg/kg, every 48 h, orally, continuous use	
18	33 kg = 1,03 m²	Methotrexate	10 mg/m², IM	
		Prednisone	0,25 mg/kg, every 48 h, orally, continuous use	
19	33,6 kg	Prednisone	0,2 mg/kg, VO, every 48 hours, continuous use	US, HG, bioq

Table 1 - Wisconsin-Madison protocol, with some changes, and the complementary tests performed on the patient in the clinical case, with gastric lymphoma, during chemotherapy treatment.

Source: Goltz (2021)

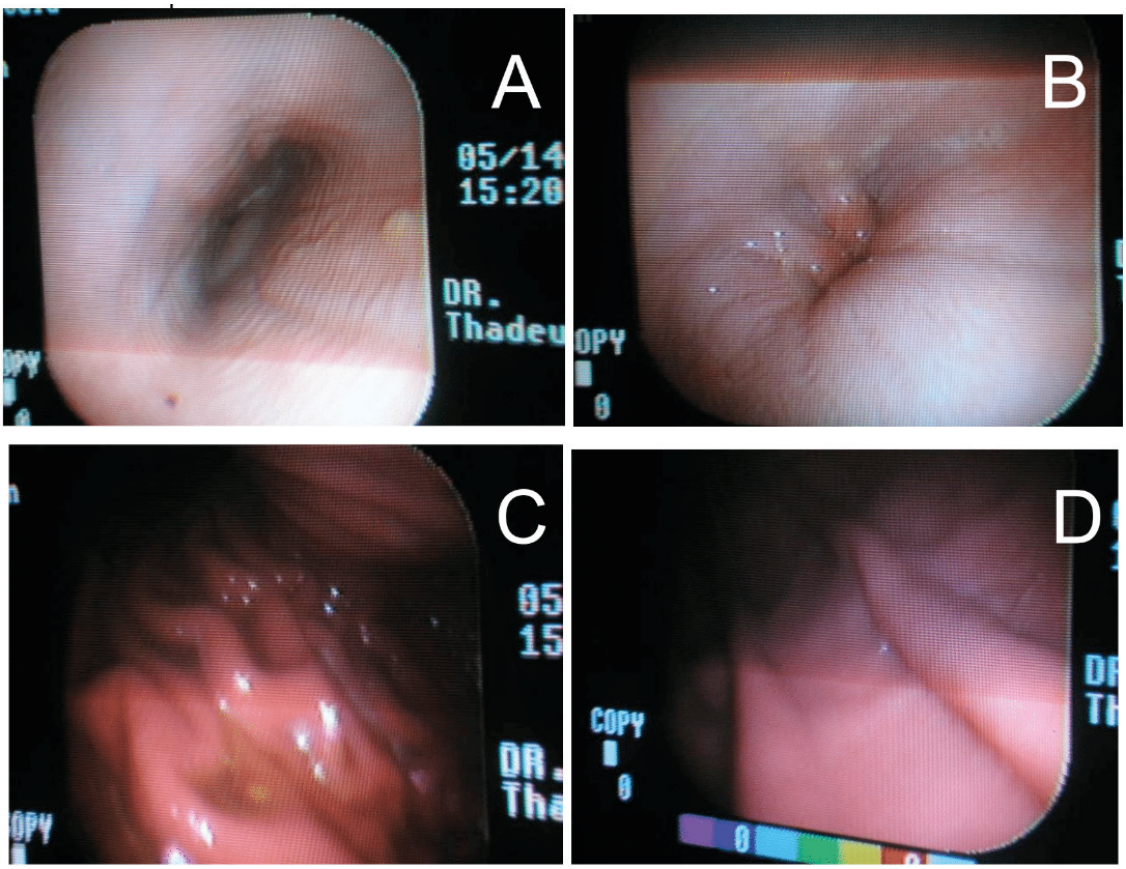

Figure 7 – Image during endoscopy of the bitch's esophagus (A), the cardia sphincter (B), both with normal appearance and without lesions, and the stomach (C and D), with normal color and the presence of folds.

Source: HCV (2021)

skin lesion, application of DMSO Gel®4 (SID, for seven days) and Cephalexin (30 mg/kg, BID, PO, for ten days) was prescribed.

In the 11th week, the electrocardiogram and blood collection for complete blood count and biochemical analysis were repeated. The electrocardiogram showed no alterations in relation to the last exam. In the hemogram, the erythrocytes were slightly reduced with a value of 5.14 x 106/L, whose RV = 5.5 and 8.5 x 106/·L, and the lymphocytes were still reduced. Levels of ALT and creatinine enzymes remained within the normal range.

On the 13th day, there was no reduction in demodicosis, and Ivermectin (0.5 mg/kg, SID, PO) and Brewer's Yeast (35 mg/kg, SID, PO) were prescribed. On the 15th week, a new abdominal US was performed for control and blood collection for complete blood count and biochemical analysis. At US, hepatomegaly was observed, with homogeneous and normoechogenic parenchyma. The kidneys were symmetrical, with the cortical-medullary relationship preserved and with areas of calcification. The spleen had no change in volume and echotexture. In the other regions, no visible echographic alterations were seen. In the hemogram, the erythrocytes, which were previously reduced, normalized. Lymphopenia decreased from 345/·L in the previous exam to 996/·L (6%). On that day, Bactrim F®5 (27 mg/kg, BID, PO, for seven days) and Ranitidine Hydrochloride (1.3 mg/kg, TID, PO, for ten days) were prescribed.

In the 19th session, the animal was active, with good appetite, without episodes of vomiting and diarrhea, it gained weight and the demodicosis lesions disappeared. On that day, an abdominal US, blood count and biochemistry were performed for control. The exams were normal, and a review in two months was recommended.

Three months after the last chemotherapy session, the tutor brought the dog back for a return visit. The animal has gained 800 grams in weight, going to 34.4 kg, is eating well, but is more irritable, had episodes of vomiting in the last fifteen days, after eating plants. The stools were normal and he had an episode of fever (39.9°C). Skin lesions due to demodicosis have returned.

In the clinical examination, the dog had a rectal temperature of 40.1°C, normal colored oral and ocular mucous membranes, normohydrate, TPC of two seconds, cardiac and pulmonary auscultation without alteration, HR of 130 bpm, RR of 28 mmm, synchronous pulse, normokinetic, unchanged lymph nodes, abdominal pain, overweight nutritional status and presence of skin lesions of pyoderma and generalized alopecia. An abdominal US and blood collection for complete blood count and biochemical analysis were performed. At US, splenomegaly and other regions without visible ultrasound alterations were observed. There were no changes in the blood test. As therapy, a reduction in the dose of Prednisone was prescribed, from 0.2 mg/kg to 0.1 mg/kg, orally, every 48 hours. It was indicated to maintain the treatment with Ivermectin and the administration of Amoxilin with Potassium Clavulanate (15 mg/kg, BID, PO, for 30 days).

Two months after the last review, the dog returned, as she began to show mild ophthalmic changes. On the day of the consultation, the right eye was observed to have increased in size, with a bluish color and noticeable ocular discomfort. The presence of hyphema, glaucoma, uveitis and lens dislocation in the right eye (Figure 6) and uveitis in the left eye were diagnosed, the owner started treatment with Still®6 and Maxitrol®7. It was recommended to return in one week for ocular US and if the intraocular pressure did not reduce in 15 days, enucleation of that eye was indicated. The use of three ophthalmic eye drops was prescribed: Cosopt®8 (in the

right eye, SID, until return); Still®6 (in both eyes, four times a day – QID, for 15 days) and Maxitrol®7 (in both eyes, QID, for 15 days).

Figure 6 – Right eye of the bitch, it is possible to see in the image the presence of glaucoma and hyphema.

Source: Goltz (2021)

At ocular US, retinal detachment and enlargement were observed in the right eye, but no intraocular tumor mass was visible. Intraocular pressure was measured again and it had increased, even with the use of eye drops to control glaucoma. The hyphema in the eye had not regressed either. The left eye showed no alterations in the US exam and the uveitis had regressed. It was recommended to maintain treatment in the right eye and stop in the left eye and, if necessary, schedule enucleation surgery for exenteration of the right eyeball. After a week, the hyphema had not regressed and the intraocular pressure continued to increase. Blood was collected to assess the general state of the animal, such as anesthetic and preoperative examination, which did not present hematological and biochemical alterations.

The following week, a gastroduodenoscopy was performed to control the evolution of the tumor, the animal continued to lose weight. During the examination, no changes were seen in the esophagus (Figure 7), nor in the cardia sphincter (Figure 7). In the stomach, normal colored mucosa was observed, with the presence of folds (Figure 7).

The pylorus had a normal appearance (Figure 8), the mucosa was unchanged and there were no surrounding nodules. Two raised nodules were counted, with irregular, non-ulcerated edges, distributed in the region between the body and the pyloric antrum (Figures 8 and 9). Material from these two nodules was collected and sent for histopathological analysis.

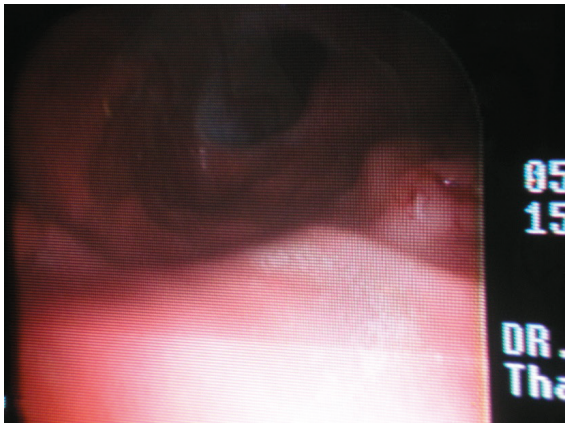

Figure 8 – Image of the bitch's pyloric antrum, indicated by the red arrow. Note the presence of a nodule (A), on the right, indicated by the yellow arrow. The visible bleeding in this nodule was caused by the collection of a biopsy specimen.

Source: HCV (2021)

In the histopathology (Figure 10) of the stomach samples, the remission of the tumor (gastric lymphoma) was verified after a period of seven months.

On the same day of the gastroduodenoscopy, the animal was sent to the surgical block to perform the enucleation surgery of the right eye, which was sent for biopsy. The results showed the presence of intraocular hemorrhage and not ocular lymphoma. As prescribed, the animal received Sucralfate (0.3 mg/kg, PO, SID, for five days), Ranitidine Hydrochloride (2 mg/kg, PO, BID, for seven days), Meloxicam (0.1 mg/kg, VO, SID, for three days), Epitezan®9 ophthalmic ointment after cleaning the surgical wound with saline solution (TID, for ten days).

Two weeks after the enucleation surgery, the animal began to show alterations in the left eye, the owner observed that the pupil was quite dilated and the dog began to see less, started to collide with obstacles and lose sight. The dog also began to present sporadic vomiting, which was brown in color and very liquid. Due to the result of the biopsy of the fragments collected during the second endoscopy, a return to chemotherapy was indicated, using the rescue protocol. On that day, the dog was very weak, with severe abdominal pain and pale mucous membranes. A new abdominal US was performed, which showed the presence of a hypoechoic mass in the stomach region and the gastric wall was thickened. The dose of Prednisone was increased to 2 mg/kg, SID and a return visit was requested in two days. A blood transfusion was also indicated, but the tutor refused.

After two days the animal returned worse. Faced with severe anemia, tumor reappearance and abrupt total loss of vision, the tutor opted for euthanasia of the dog.

DISCUSSION

The clinical case described is of a dog, of the Dobermann breed, who was diagnosed with gastric lymphoma when he was three and a half years old. In a survey carried out by Sequeira et al. (1999), of lymphoma in dogs, medium and large breeds were the most affected, such as the German Shepherd, Boxer and Doberman. There is no sex predisposition for the development of lymphomas (CARDOSO et al., 2003; MORENO; BRACARENSE, 2006; MORRIS; DOBSON, 2007; ARAUJO et al., 2008; VALL, 2008; CÁPUA et al., 2009). However, according to the literature, male dogs are more frequently affected by gastric tumors than females (MORRIS; DOBSON, 2007). The authors Sequeira et al. (1999) believe that there are indications that the incidence is lower in non-ovarian-hysterectomized females and in orchiectomized males.

At the onset of symptoms, the animal began to present chronic vomiting and diarrhea. According to the literature, at the beginning of the disease, the animal may present mild or vague and nonspecific signs. As the tumor develops, vomiting becomes more persistent (CARDOSO et al., 2004; MORRIS; DOBSON, 2007).

This dog's lymphoma was classified according to the clinical staging, based on WHO (ETTINGER, 1992; SEQUEIRA et al., 1999; CARDOSO et al., 2003; MORENO; BRACARENSE, 2006; VALL, 2008). This dog's gastric lymphoma is classified as grade IV (hepatic and/or splenic involvement, with or without stage III). The WHO anatomical classification considers the organs and tissues infiltrated by tumor cells (ETTINGER, 1992), so anatomically the tumor was classified as "B", that is, digestive.

Several exams had already been carried out, and none showed significant alteration. In the literature, the opinion of the authors regarding the use of abdominal ultrasonography (US)

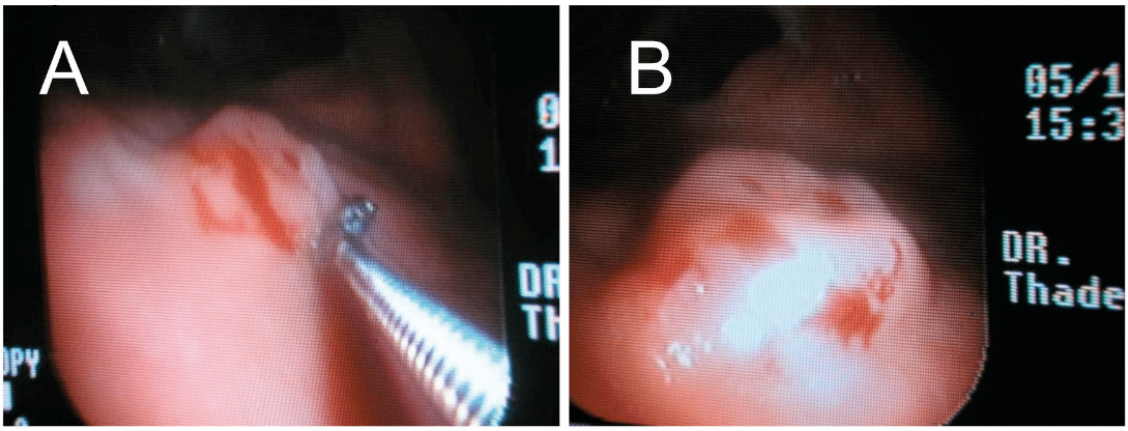

Figure 9 – Nodulation, raised and irregular, observed in the mucosa of the stomach of the bitch. Images "A" is during the collection of a fragment of the nodule and "B" is after collection, and the bleeding present in these images is due to the collection of material for histopathological analysis.

Source: HCV (2021)

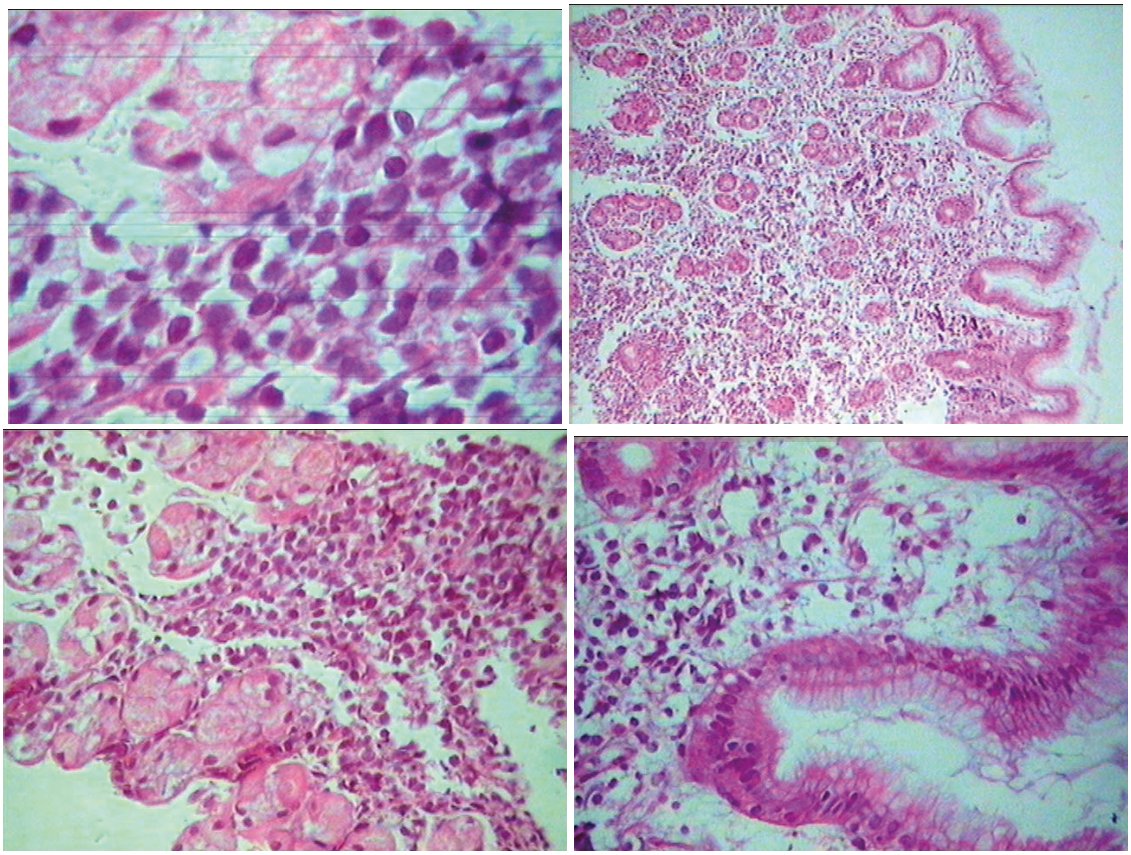

Figure 10 – Histological images of the bitch. A moderate degree of cellular and nuclear pleomorphism is observed, arranged in solid groupings in the submucosa, with imprecise limits, appearing diffuse and infiltrated in the mucosa.

Source: Laboratory: Pathos (2021)

for the diagnosis of neoplasia is somewhat controversial. For Dunn (2001), US is not always sensitive, and may provide false-positive and false-negative data, however, for Rosenthal (2004) and Morris and Dobson (2007), abdominal US may be useful in locating and measuring the lesion size, evaluation of regional lymph node enlargement and identification of distant metastases. The authors Sobral et al. (2008) consider that in the US examination it is possible to identify the shape of the lesion and the presence of ulceration, to show the thickening of the gastric wall and of the affected muscle layers and to visualize lymphadenopathy. The simple X-ray of the abdomen rarely reveals gastric neoplasia (STANTON, 1996; DUNN, 2001; MORRIS; DOBSON, 2007; SOBRAL et al., 2008).

In the contrast-enhanced X-ray, it was possible to visualize a radiopaque mass in the stomach wall, in the greater curvature of the stomach and in the pyloric region, between the stomach and the liver. The literature says that contrast-enhanced X-ray for the diagnosis of gastric tumors is based on the presence of filling abnormalities, gastric thickening and ulcerations, loss of rough fields, delayed gastric emptying, reduction or abnormality of gastric motility in specific areas, on contrasted radiographs, preferably on double contrast radiographs (STANTON, 1996; DUNN, 2001; MORRIS; DOBSON, 2007; SOBRAL et al., 2008). Therefore, the filling abnormality observed in the contrasted X-ray of the dog in this clinical case is compatible with the image of a gastric tumor mass.

On the day of the gastroduodenoscopy, it was found that the dog continued to lose weight. According to Fighera, Souza and Barros (2002) and Cardoso et al. (2004) signs of vomiting, diarrhea and steatorrhea are secondary to the malabsorption syndrome, especially when the lymphoma is in the diffuse form, with infiltration of the lamina propria and submucosa, and as a consequence of this, there is continuous weight loss in the dog.

In the gastroduodenoscopy, no esophageal changes were seen, however, the presence of multiple elevations of varying sizes, with irregular edges, spread throughout all regions of the stomach, especially in the region between the body and the pyloric antrum, was observed. Many of these lesions had areas with erosion of the gastric mucosa in their centers, whose image is suggestive of an intramural tumor. According to the literature, alimentary lymphoma is characterized by presenting solitary, diffuse or multifocal infiltrations of the gastrointestinal tract, which may appear in any area of the stomach and spread through the submucosa and lamina propria, with or without mesenteric lymphadenopathy and involvement of other abdominal organs (FIGHERA; SOUZA; BARROS, 2002; MORRIS; DOBSON, 2007; RODULFO; ORTEGA; LAPARRA, 2007). According to Stanton (1996), mucosal ulceration is common in gastric lymphoma (STANTON, 1996), however, the authors Morris and Dobson (2007) and Sobral et al. (2008), say that the tumor causes a diffuse thickening of the gastric wall, usually not ulcerated. According to Coyle and Steinberg (2004), in alimentary lymphoma, firm and soft cream-colored masses are present in the gastrointestinal submucosa and may extend from the lumen to the serosa.

For several authors, endoscopy allows the direct visualization of the lesions, without the need for surgical intervention and collection of tissue fragments from the lesions in the stomach or proximal duodenum, which are sent for histopathological examination. The result of this examination provides the veterinarian with important information for the conclusion of the diagnosis and for choosing the most appropriate treatment,

allowing to provide the owner of the animal with a more accurate prognosis (ETTINGER, 1992; CORRÊA, 1996; (STANTON, 1996; DUNN, 2001; CARDOSO et al., 2003; ROSENTHAL, 2004; MORRIS; DOBSON, 2007; SOBRAL et al., 2008; VALL, 2008).

During the gastroduodenoscopy, of the dog in this report, samples of fragments in the gastric nodules were collected for cytological analysis and biopsy, as indicated in the literature. Once the procedure was concluded, material from the right popliteal lymph node was also collected by BAAF for cytological analysis. According to the citation in the literature, alimentary lymphoma hardly affects the superficial lymph nodes (SEQUEIRA et al., 1999; COYLE; STEINBERG, 2004).

In the cytological examination of the lymph node BAAF, small and medium-sized lymphocytes, plasmocytes, some segmented neutrophils and many erythrocytes were observed, compatible with a reactive lymph node. However, the literature says that the cytoplatological examination performed by BAFF, of the lymph nodes of dogs with lymphoma, can be characterized by the presence of neoplastic proliferation of large lymphocytes, with nuclei formed by loose chromatin and evident nucleoli, which correspond to the form of lymphoblastic lymphoma. In lymphocytic lymphomas there is proliferation of small lymphocytes with mild atypical characteristics (FIGHERA; SOUZA; BARROS, 2002). In the cytology of the samples collected from the stomach, normal epithelial cells and pleomorphic lymphoblasts with irregular shape, basophilic cytoplasm, nucleus with dense chromatin and presence of mucus were observed, a result suggestive of lymphoma.

In the histopathological examination of the stomach samples, a tumor mass located in the submucosa was observed, however infiltrated in the mucous, muscular and serous layers, with a high mitotic index, areas of necrosis and acute inflammation and composed of proliferation of blastic lymphoid cells with a moderate degree of pleomorphism cellular and nuclear, arranged in solid groups separated by connective septa. The literature mentions that in the anatomopathological analysis, lymphoma appears as an infiltrative neoplastic process, of very aggressive lymphoid origin, which alters the architecture of the gastric and intestinal mucosa (RODULFO; ORTEGA; LAPARRA, 2007), and neoplastic cells appear infiltrated in the mucosa gastric and intestinal and in the glandular epithelium (COYLE; STEINBERG, 2004). In medium-intensity lymphomas, the cells are larger, with an abnormal nucleus or varying between normal and abnormal and with a greater number of mitotic figures, and the disposition can be diffuse or nodular (JONES, 2000). Lymphoblastic or poorly differentiated lymphoma is characterized by atypical cells, larger than the cells of the previous types, but smaller than the cells of histiocytic lymphoma, and the cells are of similar sizes, with a round nucleus, condensed chromatin, evident nucleolus, scarce cytoplasm and presence of mitotic figures. The lymphoblastic form is the most frequent in dogs (CARDOSO et al., 2003). The result of this biopsy is characteristic of gastric lymphoma.

The main causes of lymphopenia are nutritional deficiencies, stress, repeated bacterial infections, acute phase of the flu, failure in medullary production, excess destruction, cell losses through the lymphatic ducts of the intestine, intrinsic defects of B lymphocytes, T or cells that participate of immunological mechanisms (NELSON; COUTO, 2006; NASCIMENTO, 2008). Lymphopenia is a consequence of myelosuppression, and most antineoplastic drugs are responsible for causing it (ANDRADE, 2002).

Clinical treatment was with omeprazole,

ranitidine, metoclopramide and ondansetron. As described in the literature, clinical treatment with antiemetics, H2 receptor antagonists and proton pump inhibitors is of great importance, as it improves the quality of life of the animals and offers comfort during the survival period (SOBRAL et al., 2008). After the gastroduodenoscopies, the dog was also prescribed sucralfate, which binds to the ulcerated areas and increases reepithelialization, mucus production and neutralizes bile acid salts, forming a coating on the injured mucosa (STANTON, 1996). Chemotherapy started on April 27, following the Wisconsin-Madison Protocol, with some changes. The University of Winconsin-Madison protocol is quite complex, but it presents excellent results, since most dogs present good remission of the clinical picture (ARAUJO et al., 2008; VALL, 2008). This protocol consists of the drugs L-asparaginase, vincristine, cyclophosphamide, doxorubicin and methotrexate (ARAUJO et al., 2008; DALECK; CALAZANS; NARDI, 2008; CÁPUA et al., 2009). According to some studies, L-asparaginase can be suspended at the beginning of the protocol, since its administration does not change the response to treatment and survival time, and it can be used later in "rescue" or "rescue" therapy (DALECK; CALAZANS; NARDI, 2008).

On the days of application of doxorubicin, promethazine was also applied. Medications were administered using latex gloves, as the owner was instructed to do during the administration of cyclophosphamide tablets. When the medications were administered intravenously, venoclysis of the animal was performed and 0.9% saline solution was administered to certify that the vessel was correctly accessed. Most antineoplastic agents are potentially cytotoxic, for this reason, people, when handling these drugs and administering them to the animal, must wear latex gloves.

At the first consultation, US was performed, which detected a mass in the epigastric region. In 15 days, in the second chemotherapy session, another US was performed to control the size of the mass. That day it was noticed that the nodule continued to increase in size and was next to the right hepatic lobe. In the fifth week of chemotherapy, another abdominal US was performed to control the evolution of the tumor and evaluate the functioning of the chemotherapy protocol, the nodule was decreasing in size. Other US were repeated at the ninth, fifteenth, nineteenth week of treatment and three months after the last chemotherapy session. In the ninth session, the nodule continued to reduce. At the fifteenth week, the abdominal mass was no longer visible, but hepatomegaly was observed. It is common for digestive lymphomas to be accompanied by hepatomegaly and splenomegaly. These two alterations result from the invasion of these organs by neoplastic lymphoid cells, and this can be confirmed through cytological and histopathological examinations (SEQUEIRA et al., 1999; CARDOSO et al., 2004). In the nineteenth session, the US showed no alterations. The periodic evaluation of the animal with lymphoma is extremely important before, during and after the chemotherapy treatment, through blood counts, biochemical exams and urinalysis (ANDRADE, 2002; MORENO; BRACARENSE, 2006), for a better definition of the general state of the animal giving support for the diagnosis, prognosis and treatment of canine lymphoma (CARDOSO et al., 2004).

Until the second week of chemotherapy, the animal continued to be prostrate and vomiting. From the third treatment session she was more willing, but continued to lose weight. From the fourth week of chemotherapy, the animal began to gain weight. After the

first three treatment sessions, the dog was well, willing, with appetite, with rare reports of vomiting or diarrhea. The weight fluctuated a lot, but in a small amount at a time, but little by little the animal recovered its normal weight and became overweight at the end of the treatment. According to Andrade (2002), the cause of malnutrition due to neoplasia is multifactorial, anorexia may be due to anorectic factors produced by the tumor, pain or gastrointestinal obstruction, aggression from antineoplastic therapy and metabolic alterations.

In the fourth week of chemotherapy, a complete blood count and a biochemical analysis were performed to observe the changes caused by the treatment. In this examination, lymphopenia and an increase in the hepatic enzyme ALT were observed. After the seventh chemotherapy session, blood count and biochemical examination were performed again, and lymphopenia was still present, but ALT had returned to normal levels. In the eleventh week, the blood count showed mild anemia and lymphopenia again. In the fifteenth session, the erythrocytes were normalized and the lymphopenia reduced, although it was still present. In the nineteenth week, the hemogram and the biochemical exam were within normal parameters. According to the literature, some hematological and biochemical abnormalities can be observed in dogs with lymphoma (MORENO; BRACARENSE, 2006; VALL, 2008), however the biochemical and hematological findings are nonspecific and varied. Changes in the biochemical profile and urine analysis are infrequent (CARDOSO et al., 2004).

The most recurrent hematological alterations are anemia, leukocytosis and thrombocytopenia. Leukocytosis, neutrophilia and lymphocytosis may occur due to the invasion of neoplastic cells in the bone marrow or secondary infections (CARDOSO et al., 2004). Anemia, when present, may be related to blood loss, hemolysis, hyporexia, anorexia, digestive disorders, bleeding disorders such as hematemesis, melena, and may also be due to the release of neoplastic factors, causing hypoplastic anemia (FIGHERA; SOUZA; BARROS, 2002; VALL, 2008). In the animal of this clinical case, leukocytosis was not observed, as the literature cites as frequent in lymphomas. Thrombocytopenia was observed in the blood counts on April 14, 2008, before starting chemotherapy and in the eleventh week of treatment, but it was caused by platelet aggregation in the blood sample.

Increased serum levels of liver enzymes (ALT – alanine aminotransferase, FA – alkaline phosphatase, GGT – gamma glutamyl transferase and BT – total bilirubin) or the level of bilirubin may be representative of neoplastic infiltration in the liver (VALL, 2008). In the case of an increase in these enzymes, a liver histopathological examination is indicated. (CARDOSO et al., 2004). Liver involvement is common in lymphomas, but there are no pathognomonic signs to determine the involvement of this organ, however elevation of alkaline phosphatase, alanine transferase and bilirubin levels may occur, but these changes are not specific and have no prognostic value for tumor involvement liver (VALL, 2008).

After the fourth week of chemotherapy, the dog began to show areas of thinning hair on the chin and paws, the animal had already been diagnosed with demodicosis at eight months of age. As cited in the literature, acquired immunological incompetence associated with systemic disease, therapy with glucocorticoids and chemotherapy may precipitate demodicosis in adult or elderly dogs (DUNN, 2001).

In the eighth and eleventh week of treatment, the dog underwent an electrocardiogram in order to verify if there was any cardiac alteration due to the chemotherapy. When

chemotherapy treatment with doxorubicin is performed, it is important to add an echocardiogram to the periodic exams, as this exam can be used in the monitoring and prevention of the cardiotoxicity caused by this drug (SILVA; CAMACHO, 2005). The result was sinus arrhythmia with axis deviation to the left, suggestive of right ventricular enlargement. Generally, in addition to the signs similar to dilated cardiomyopathy caused by the cardiotoxic effect of doxorubicin, the first sign of cardiotoxicity in dogs, evaluated in the echocardiographic exam, is the increase in the diameter and volume of the left ventricle (SILVA; CAMACHO, 2005), however the dog in this report had an enlarged right ventricle.

Chemotherapy continued until the nineteenth session, when it was no longer possible to visualize alterations in the abdominal US. According to the literature, the Winconsin-Madison protocol lasts for nineteen weeks, and it is recommended that if complete remission occurs this week, the treatment must be interrupted and monthly reassessments must be made (VALL, 2008). Therapy with prednisone at a dose of 0.2 mg/kg every 48 hours was maintained.

Three months after the end of chemotherapy, the patient returned for review. The tutor reported some occasional episodes of vomiting during the period since the interruption of chemotherapy treatment. Close to the day of the return visit, the dog had a few more episodes of vomiting. On that day 4, the animal had fever, lymph nodes without change, abdominal pain and demodicosis lesions. According to Cardoso et al (2004), fever may be present in some dogs with digestive lymphoma, especially those with secondary infections. Secondary infection occurs because of immunosuppression of malignant tumors of lymphoid and hematopoietic organs and by chemotherapy treatment. Demodicosis is often accompanied by secondary infections, and at that time the dog was again showing lesions of demodicosis, which is one of the possible causes of the fever. Blood count and biochemical analysis were performed, which did not show alterations, and abdominal US was repeated, in which splenomegaly was observed. As previously mentioned, it is common for digestive lymphomas to be accompanied by splenomegaly and hepatomegaly (SEQUEIRA et al., 1999; CARDOSO et al., 2004). The prednisone dose was reduced to 0.1 mg/kg every 48 hours. From the nineteenth week, 1 mg/kg of Prednisone must be administered on alternate days (VALL, 2008).

Five months after the end of chemotherapy, the dog began to present ophthalmic alterations in the right eye. The presence of hyphema, glaucoma, uveitis and lens dislocation in the right eye and uveitis in the left eye were observed, however, even after clinical treatment, the problem persisted. In the literature it is commented that ophthalmic abnormalities are present in more than a third of dogs with lymphoma. Commonly found alterations are uveitis, hemorrhage and ocular infiltration (VALL, 2008). The paraneoplastic syndrome can also be characterized by causing ocular abnormalities (RAMOS et al., 2008). At ocular US, retinal detachment was observed in the right eye, however, no intraocular mass was visible.

This examination was performed because it was suspected that there might be metastasis of the lymphoma to the eye. The suspicion of lymphoma metastasis to the eyeball is because lymphoma is the neoplasm that most metastasizes to the eye in dogs, and 37% of canine lymphomas present ocular involvement, accompanied by injury. (ROSENTHAL, 2004). Ocular lymphoma is an extranodal lymphoma. The most common clinical signs are photophobia, blepharospasm, epiphora, hyphema, hypopyon, ocular mass,

anterior and posterior uveitis, glaucoma, conjunctivitis, exophthalmos, synechiae, panuveitis, chorioretinal involvement, retinal detachment, retinal hemorrhage, and corneal, retinal, and retinal infiltration. conjunctiva, nictifying membrane or orbit by the tumor (CARDOSO et al., 2004; ROSENTHAL, 2004; MORRIS; DOBSON, 2007).

As the treatment to reduce intraocular pressure was not successful, we opted for enucleation with exenteration of the right eyeball to reduce the dog's discomfort. The eyeball was sent for histopathology for analysis, however the examination did not observe the presence of a tumor mass. Two weeks after the enucleation surgery, the animal began to show alterations in the left eye, indicative of blindness.

The treatment of extranodal lymphoma depends on the site involved and the extent of the disease, it is considered a local disease, which after complete staging, can be treated locally, for example, in the case of ocular extranodal lymphoma, the recommendation is enucleation or radiotherapy, without the need for systemic chemotherapy. After that, the animal must be reassessed frequently, so that in case of relapses or systemic dissemination of the neoplasm, it is identified early on. If there is systemic involvement, chemotherapy must be restarted (VALL, 2008).

One week after the appearance of the ophthalmic alteration, the hemogram and the biochemical analysis were repeated, which resulted in no alterations. And the following week, the gastroduodenoscopy was repeated. At gastroduodenoscopy, two raised nodules were found in the stomach, with irregular, non-ulcerated edges, distributed in the region between the body and the pyloric antrum. Material was collected from these two nodules, which were sent for histopathological analysis. The pylorus had a normal appearance, with no change in the mucosa and no surrounding nodules. In histopathology, the result was characteristic of gastric lymphoma, meaning tumor remission after a period of seven months. According to Capua et al. (2009) quotes, about 65 to 96% of dogs respond well to the Winconsin-Masidon protocol, and have the first remission in six to nine months, but the second remission is usually smaller than the first.

Two weeks after the endoscopy, the dog began to present sporadic vomiting, which was brown in color and very liquid. The blood present in vomit, according to Cardoso et al. (2004) may be partially digested, with the appearance of "coffee grounds". Hematemesis is present in dogs whose gastric lymphoma is ulcerated. Due to the result of the biopsy of the fragments collected during the second endoscopy, a return to chemotherapy was indicated to initiate a "rescue" protocol, which was not effective and the tutor opted for euthanasia, completing 15 months of treatment with quality of life.

CONCLUSION

The dog reported in this work was young and the period from the observation of the first clinical signs to the definitive diagnosis was four months, showing that the rapid evolution of this tumor and the delay in diagnosis made the animal very debilitated. The Winconsin-Madison chemotherapy protocol was effective and lasted seven months, completing nineteen weeks of chemotherapy sessions, and the dog showed rapid improvement in clinical signs. At the end of chemotherapy, it took 15 months for the tumor to reappear, concluding that the Winconsin-Madison chemotherapy protocol adopted was effective and provided an expected survival time for the animal, with quality of life.

MANUFACTURERS

[1] Pankreoflat® - Apsen - Pancreatin triplex (170 mg), Dimethicone (80 mg)

[2] Ornitargin® - Baldacci - Arginine Hydrochloride (185 mg), Ornithine Aspartate (60 mg), Citrulline (5 mg)

[3] Advocate 4 ml® - Bayer - Imidacloprid (100 mg), Moxidectin (25 mg)

4 DMSO Gel® - Vetnil - Dimethylsulfoxide

[5] Bactrim F® - Roche Sulfamethoxazole (400 mg), Trimethoprim (80 mg)

6 Still® - Allergan - Diclofenac Sodium (0.1%)

[7] Maxitrol® - Alcon - Dexamethasone (0.1%), Neomycin (0.35%), Polymyxin B Sulfate (6000 IU

[8] Cosopt® - Merck Sharp & Dohme - Dorzolamide Hydrochloride (2%), Timolol Maleate (0.5%)

[9] Epitezan® Ophthalmic Ointment - Allergan -Retinol (10000 IU), Amino Acids (2.5%), Methionine (0.5%), Chloramphenicol (0.5%)

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