

LARGE CELL INTESTINAL LYMPHOMA IN A CAT - CASE REPORT

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Abstract: Lymphomas or lymphosarcomas are neoplastic diseases that affect a large number of domestic felines, classified into four categories and, among these, food lymphoma stands out, found in 70% of cats, affecting mainly the intestine, in second place the stomach and, to a lesser extent, the mesenteric lymph nodes of the animal. Histologically they are divided into: low grade; intermediate grade or high grade and large granular lymphocytes, the latter more aggressive, rapid course, little or no remission, even with the adoption of a chemotherapy protocol. Life expectancy is short and clinical signs are non-specific, confusing them with inflammatory bowel diseases, which contributes to the rapid advancement of neoplasia without the adoption of adequate treatment. This paper presents, initially, a brief bibliographical review on lymphomas or lymphosarcomas in domestic felines and, in the sequence, addresses a clinical case report of alimentary lymphoma of large cells of the type large granular lymphocytes in a male feline, mixed breed, castrated, 13 years old, positive for feline immunodeficiency (FIV), with a history of inappetence, frequent vomiting of semi-digested food mixed with hairballs, diarrhea and discomfort on abdominal palpation. The aim of this work is to alert veterinarians about the occurrence of this type of neoplasm, which is highly aggressive and has a rapid course, with nonspecific clinical signs and a wide differential diagnosis for several diseases of the intestinal tract.

Keywords: Intestinal lymphosarcoma. Large cells. Feline. Early diagnosis. Neoplasm.

INTRODUCTION

The increase in the life expectancy of domestic animals, especially the domestic feline species, is a constant reality in veterinary clinics, with possibilities for more advanced and cutting-edge diagnoses, exams and treatments, similar to those of human medicine, and this has been analyzed and weighted as a promising reality in the advancement of veterinary medicine. As a consequence of technological advances, numerous diseases of different etiologies, previously unidentified and diagnosed, especially neoplastic ones, which cause a significant number of deaths among pets (SALVADO, 2010), are beginning to be analyzed from a new point of view: the of partial or total remission, generating beneficial consequences such as increasing the animal's life expectancy. Thus, it is up to the Veterinarian to diagnose the neoplasm based on the history, anamnesis, clinical signs and complementary exams, and this way he must master the subject in order to transmit and explain to the tutor what the meaning of this finding is in the health and well-being of his pet. pet, also responding to all questions regarding the possible origins, triggering factors, monitoring, possibilities of treatments with the aim of remission, staging, cure or simply adequate support treatment in the animal's quality of life (VAIL; OGILVIE, 2003).

Lymphomas are clonal proliferative neoplasms of malignant lymphocytes (CALAZANS; DALECK; DE NARDI, 2016). Among neoplastic diseases, lymphomas or lymphosarcomas in domestic cats correspond to 70% of clinical occurrences (NORSWORTHY et al., 2013). These tumors are located mainly in the body's lymphoid cells represented by the thymus, bone marrow, liver, spleen and lymph nodes (RODASKI; PIEKARZCH, 2009; CALAZANS; DALECK; DE NARDI, 2016) and are installed in any of

these organs, being lymph nodes are the most common sites.

Due to the common characteristic of the physiological migration of neoplastic cells through the body's tissues, there may still be the installation of these, in any other organ (RODASKI; PIEKARZCH, 2009; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016).

Lymphomas are classified into categories according to anatomical form, site of occurrence, histopathological pattern and immunophenotypic determination, such as mediastinal or thymic lymphoma, multicentric lymphoma, extranodal lymphoma and alimentary or gastrointestinal lymphoma (RICHTER, 2003; NELSON; COUTO, 2006; WILSON, 2008; BARRS; BEATTY, 2012; CALAZANS; DALECK; DE NARDI, 2016). Mediastinal and alimentary lymphomas are very common in cats, the latter being found in 70% of cats with this neoplasm, an American and European statistical percentage, in the post-FeLV era, not being a reality in Brazil, where mediastinal lymphomas are the majority (NELSON; COUTO, 2006).

Alimentary lymphomas originate through the infiltration of lymphoid cells of the organs of the gastrointestinal tract such as the intestine, stomach, regional lymph nodes and in some cases the liver and spleen (ROCHA, 2013), with or without involvement of adjacent mesenteric lymph nodes. (WILSON, 2008; LINGARD et al., 2009). In felines, alimentary lymphoma mainly affects the intestine, secondly affects the stomach and, less frequently, the mesenteric lymph nodes (VALLI et al, 2000; FERREIRA, 2017).

From studies carried out by the National Cancer Institute of the United States (National Cancer Institute Working Formulation - NCIWF), for human medicine and later adapted to veterinary medicine, the histological types of lymphomas in

domestic felines were grouped under grade, intermediate grade to high grade and large granular lymphocytes (VALLI et al, 2000; MORRIS; DOBSON, 2007; BARRS; BEATTY, 2012; FERREIRA, 2017).

The occurrence of the disease in domestic felines is frequent in cats of mixed breed, male, aged between ten and 13 years and positive test for the feline leukemia virus (FeLV) (CHANDLER; GASKELL; GASKELL, 2006). There are also reports of the pathology in cats exposed to cigarette smoke (BERTONE; SNYDER; MOORE, 2002) and chronic intestinal inflammation (AMORIM et al., 2006; CHANDLER; GASKELL; GASKELL, 2006; CALAZANS; DALECK; DE NARDI, 2016).

Among the main clinical signs, we highlight: inappetence, anorexia, diarrhea, emesis and weight loss, in addition to great abdominal discomfort. Intestinal obstruction or peritonitis may still occur as a result of possible disruption of the lymphomatous mass present in that location (NELSON; COUTO, 2006). During the physical examination of abdominal palpation, abnormal findings such as diffuse intestinal thickening, presence of abdominal mass due to enlargement of mesenteric lymph nodes or focal intestinal mass may be found (ARAUJO, 2009).

The location, anatomical shapes, histological classification, associated with clinical signs and complementary exams will be of fundamental importance for the response to the type of treatment and possible staging of the neoplasm (BADO, 2011; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016).

The present work aims to carry out a bibliographic review on alimentary lymphoma as well as to report a clinical case of intestinal large cell lymphoma in a domestic feline, analyzing and detailing the specific clinical signs.

REVIEW OF LITERATURE

Alimentary lymphomas originate from the infiltration of lymphoid cells of the organs of the gastrointestinal tract such as the intestine, stomach, regional lymph nodes and in some cases the liver, spleen (BRISCOE et al., 2011; ROCHA, 2013) and pancreas (BRISCOE et al., 2011).

The histological presentations of alimentary lymphoma are: Small cell, lymphocytic, low grade, well differentiated, originating from T lymphocytes; Large cell, high-grade lymphoblastic, originating in B or T lymphocytes and large granule lymphoma classified as a subtype characterized by the presence of natural killer T lymphocytes, which have intracytoplasmic granules (RICHTER et al., 2003; BADO, 2011; BARRS; BEATTY, 2012; BARRIGA, 2013; NOGUEIRA; MELO, 2020).

The incidence of lymphomas is associated with the characteristics of mixed breed domestic cats (SRD), male, aged between ten and 13 years, carriers of the feline leukemia virus (FeLV). On the other hand, cats with feline immunodeficiency (FIV) are also susceptible to present indirect induction of lymphomas through the weakened immune system by the joint action of other oncogenic viruses present (MAGDEN; QUACKENBUSH; VANDEWOUD, 2011). Thus, mainly FIV and FeLV are pathologies predisposing to lymphoma (CALAZANS; DALECK; DE NARDI, 2016).

Two other factors described in the literature refer to the predisposition to lymphoma, which are exposure to cigarette smoke (BERTONE; SNYDER; MOORE, 2002; VAIL, 2007; CASTILLO; DALIA, 2012), which represent risks of 2.4 to 3, 2 times more to develop lymphoma and chronic intestinal inflammation (VAIL, 2007; BRYAN, 2010; BARRS; BEATTY, 2012).

Domestic felines will show the following

clinical signs, according to the form of presentation (BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016). Low-grade lymphomas have a prolonged duration of clinical signs, taking months before they are diagnosed. It is less aggressive, chronic and the signs last for months. They reach mature cells and the disease installs itself slowly and progressively, presenting anorexia with weight loss, weight loss, in more than 80% of cases, hypoproteinemia resulting from malabsorption, emesis, chronic diarrhea or constipation, dehydration, on palpation a slight thickening of the intestinal loops and discreetly palpable or nonexistent abdominal mass (WILSON, 2008; NORTH; BANKS, 2009; RECHE JR. et al., 2010; BARRS; BEATTY, 2012; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016).

Intermediate lymphomas, classified as high-grade or large-cell lymphomas, present with rapid evolution of gastrointestinal signs, for example, vomiting, diarrhea, acute anorexia, weight loss and jaundice, and may also present with hypoproteinemia and dehydration. On palpation, they show thickening of the intestinal loops or abdomen with a palpable focal mass. The presentation is acute or severe and has a rapid course, reaching the same organs as low-grade lymphoma (GIEGER, 2011; BARRS; BEATTY, 2012; BARRIGA, 2013).

Large granular lymphocytes present with an intestinal focal mass, thickened and easily palpable intestinal loops, splenomegaly, hepatomegaly, mesenteric lymph node, kidney and liver masses. Anemia, erythrocytosis, leukocytosis, neutrophilia, lymphocytosis, eosinophilia, thrombocytopenia, peripheral lymphoblasts, hypoalbuminemia. Its course is fast and aggressive, with signs ranging from severe to extremely severe (GIEGER, 2011; BARRS; BEATTY, 2012; CALAZANS; DALECK; DE NARDI, 2016).

Felines with alimentary lymphoma show alterations in laboratory tests (hemogram, serology, liver and kidney function tests) and imaging tests (abdominal ultrasound, magnetic resonance or computed tomography), with biopsies and histopathological tests being conclusive for diagnosis (CALAZANS; DALECK; DE NARDI, 2016).

When there is suspicion of the involvement of alimentary lymphoma in felines, carrying out complete laboratory tests are essential, as in addition to demonstrating the possible hematological changes due to the disease, it provides the veterinarian with an overview of the clinical status of the animal, necessary and essential for nutritional corrections. This overview of the nutritional status makes it possible, at the beginning of oncological and/or pre-surgical therapy, to guarantee the cat's survival while the neoplastic disease has not been staged, as well as the animal's general well-being (CALAZANS, DALECK; DE NARDI, 2016).

The expected results through laboratory hematological evaluation, through complete blood count and serum biochemistry in cats affected by alimentary lymphoma, are in most animals characterized by anemia and its variables, erythrocytosis, leukocytosis, neutrophilia, lymphocytosis, eosinophilia, thrombocytopenia, lymphoblasts peripheral nerves, hypoalbuminemia in high-grade lymphomas. In low-grade lymphomas, hypocobalaminemia and changes in feline-specific pancreatic lipase (fPLI) may occur (BARRS; BEATTY, 2012; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016; BOTELHO, 2019). It is also important to carry out the coproparasitological examination in order to rule out infections by various worms (WILLARD, 2001; BARRS; BEATTY, 2012).

In felines that present the clinical suspicion of alimentary lymphoma, the ultrasonography exam is essential because, in addition to

providing information regarding the location, measurement and degree of involvement of the disease on the organs, they provide direction regarding the possible lines of approach for the disease. disease with the respective treatment protocols (NELSON; COUTO, 2006; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016; BOTELHO, 2019).

The main findings in ultrasound exams in cats with suspected alimentary lymphoma are thickening of the stomach walls equal to or greater than 0.5 cm, thickening of the intestinal walls in more than two different locations, whose measurements are equal to or greater than 0, 28 cm or, in a single location, with measurements equal to or greater than 0.30 cm, presence of mass(s) in the abdominal region, intestinal hypomotility, reduced echogenicity of the intestinal wall and ascites (GROOTERS et al., 1994; PENNINGCK et al., 1994).

In some cases, as the disease progresses, there may be other changes in the size and echogenicity of the liver, spleen, kidneys and lymph nodes (NELSON; COUTO, 2006). Also, in the case of low-grade alimentary lymphoma, the intestinal layers may be preserved in the ultrasound examination, which may make it difficult to distinguish between the neoplastic and inflammatory process. On the other hand, when dealing with high-grade alimentary lymphoma, ultrasonography will reveal loss of stratification of the intestinal layers and alteration of the intestinal muscle (ZWINGENBERGER et al., 2010).

Performing cytological exams through fine needle aspiration (FNAB), guided by ultrasound, is not reliable in cases of low-grade alimentary lymphoma, as it tends to be diffuse in terms of differentiating the morphological characteristics of neoplastic lymphocytes from enteritis in general, causing confusion in the results, making them appear normal to the cytological examination, which is not

consistent with reality (NELSON; COUTO, 2006; VAIL, 2007; CALAZANS; DALECK; DE NARDI, 2016; WEBER, 2016). On the other hand, in other cases of alimentary lymphoma, the cytological investigation is essential and justifiable, since it will present as one of the probable results the presence of lymphocytes with intracytoplasmic granules in the cells (KRICK et al., 2008) which evidences, in this case the large granular lymphocyte lymphoma (LLGG), allowing definitive differentiation from other types of lymphomas, guiding the veterinarian to the appropriate conduct regarding treatment and prognosis (VAIL, 2007; CALAZAN; DALECK; DE NARDI, 2016).

Endoscopy is a technique used in the collection of tissues and cells in the gastrointestinal tract in order to detect the most diverse pathologies, especially neoplasms (JERGENS, 2005; BOTELHO, 2019). This type of exam has some characteristics such as ease and speed of execution, it is not invasive and requires a short period of hospitalization. When there is suspicion of alimentary lymphoma, endoscopy can be performed associated with a less complex incisional biopsy (CALAZANS; DALECK; DE NARDI, 2016).

Among the disadvantages of the technique, there are limitations regarding the anatomical reach of the equipment to the small intestine, being useful only for the detection of lymphoma at the gastric level, proximal duodenum and, when performing lower digestive endoscopy, it allows the detection of lymphoma in the intestine thick reaching to the distal portion of the ileum. It may be considered inappropriate for the purpose of collecting material in places with the highest incidence of alimentary lymphoma (EVANS et al., 2006). Another important aspect to highlight, regarding the diagnosis by endoscopy, is that this technique is not appropriate to distinguish

chronic inflammatory bowel disease (IBD) from alimentary lymphoma, since the samples collected from the epithelium are predominantly superficial, including mucosa, submucosa and rarely a small portion of the muscle (SIQUEIRA, 2012; COSTA et al., 2018).

Biopsy, whether incisional or excisional, is the gold standard exam used to obtain tissue and cell samples for histopathological evaluation and classification (CALAZANS; DALECK; DE NARDI, 2016). The two main methods used to collect material are through videolaparoscopy (EVANS et al., 2006; BADO, 2011) or exploratory laparotomy (LEIBMAN; LARSON; OGILVE, 2003; RICHTER, 2003; EVANS et al., 2006; WILSON, 2008; KLEINSCHMIDT et al., 2010; BADO, 2011; SMITH et al., 2011), where tissue samples from the liver, pancreas and lymph nodes must also be collected (BARRIGA, 2013; NORSWORTHY et al., 2015; BOTELHO 2019).

Initially, to opt for the biopsy examination, some clinical signs must be considered, such as weight loss equal to or greater than 0.5 kg in the last six months, the occurrence of chronic vomiting, more than three times a month, in the last three months and diarrhea in the last three weeks (AMORIM, et al., 2006).

Histopathological studies are one of the main keys to the definitive diagnosis in cases of neoplasms, they are based on careful examinations of the tissues collected during the biopsy, which classify lymphomas according to the degree of malignancy present in the collected tissue fragments, describing the various alterations cellular effects such as the occurrence of pleomorphism, anisokaryosis, increased frequency of Mitosis Figure, atypical mitoses and evident nucleoli during cell division (CHEVILLE, 2006).

In intestinal lymphoma, the differential diagnoses are extremely relevant because they

include other diseases that affect felines, and the degree of importance must be considered. Differential diagnoses in low-grade lymphomas are the feline triad, lymphoplasmacytic enteritis, foreign bodies, gastritis, ulcers, food intolerance or hypersensitivity, the main causes of inflammatory bowel disease (IBD); regarding high-grade lymphomas, neoplasms such as intestinal mastocytoma and intestinal carcinoma are highlighted (CALAZANS; DALECK; DE NARDI, 2016).

From the diagnosis, the evaluation of the clinical stage of the neoplasm must begin, according to the severity of the animal. Staging does not only refer to the growth rate and extent of the disease, but mainly to the type of neoplasm (JERICO; NETO; KOGIKA, 2015; CALAZANS; DALECK; DE NARDI, 2016).

The clinical staging system recommended by the International Union for Cancer Control (UICC) and the WHO, classify malignant neoplasms according to the main characteristics and anatomical extension of the disease, they are: primary tumor (T), lymph nodes of the organ in that the tumor is located (N) and presence or absence of distant metastases (M) (NELSON; COUTO, 2006). These are pre-established rules and their use is admitted in the diagnosis of canine and feline species. Dogs and cats are more frequent in stages III (in which there is generalized lymph node involvement), IV (stage III signs in addition to hepatomegaly and/or splenomegaly) and V (also presenting extranodal or bone marrow involvement) due to lack of observation by tutors in the initial stages I (involvement limited to one lymph node or lymphoid tissue) and II (presence of extranodal tumor with regional lymph node involvement) (NELSON; COUTO, 2006; CALAZANS; DALECK; DE NARDI, 2016).

Treatments for alimentary lymphoma consist of chemotherapy protocols, surgical resection or radiotherapy, depending on

the stage, type of lymphoma, degree of aggressiveness and neoplastic presentation in one or more organs. It is important to highlight, at this moment, the care regarding the general health conditions of the feline, under the risk of losing it due to precipitation or inappropriate conduct (BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016).

From the conclusive diagnosis of alimentary lymphoma, one of the possible treatments to be instituted in felines will be chemotherapy. This will follow a protocol based on the rates of positive responses, the time of remission and the degree of presentation of the lymphoma (WILSON, 2008). But, before starting any chemotherapy protocol, it is important to verify the animal's clinical health conditions with complete blood count, biochemicals and urinalysis.

Supportive treatment from the diagnosis of alimentary lymphoma, aims to ensure the well-being, quality of life and longevity of the feline and must be strictly monitored before, during and after the occurrence of surgeries, biopsies and chemotherapy treatment protocols, as it is the gold standard in guaranteeing survival (ORTIZ et al., 2019).

The conduct in the supportive treatment consists of fluid therapy for cases of dehydration, blood transfusion for hemorrhages or deep anemia, use of analgesics for pain, antiemetics, antacids, antibiotics, enteral nutrition, via probe (GIEGER, 2011; NOGUEIRA; MELO, 2020) or parenteral (FERREIRA et al., 2017), appetite stimulants and supplementation with cobalamin and folate (AMORIM, 2008; BARRIGA, 2013; ORTIZ et al., 2019). conduct supporting animal welfare. Furthermore, the association with acupuncture may provide good results regarding pain control (YIN, et al., 2007; LOONEY, 2010).

The favorable, unfavorable or reserved prognosis for lymphomas in general is complex, depending on several factors such as

the degree of the neoplasm, location, clinical signs for the feline's health conditions, the chemotherapy protocols adopted, remission, or not., positive testing for FIV (feline immunodeficiency virus) and/or FeLV (feline viral leukemia) and the individual response presented by each animal to therapy (CUNHA, 2018).

The nutritional status of the animal directly interferes with the prognosis, in view of the side effects of the adopted chemotherapy protocols, promoting a marked reduction in life expectancy. Negative cats for FeLV and FIV are the ideal cats to achieve remission of low-grade lymphomas, when submitted to a chemotherapy protocol and have a longer survival time (SANTOS; POENTE; BROMBINI, 2013).

Low-grade lymphomas have a favorable prognosis, with a long period of remission and longer survival time, when prednisolone and chlorambucil are combined with chemotherapy. The average survival time in this case is between 19 and 29 months. In neoplasms due to high-grade or intermediate-grade lymphomas, the CHOP chemotherapy protocol is used, which induces an average survival period, estimated between seven and ten months, a shorter period when compared to low-grade lymphoma (CALAZANS; DALECK; DE NARDI, 2016).

When a feline is diagnosed with LLGG, the prognosis is completely unfavorable and the average lifespan is between 17 and 45 days (VAIL et al., 1998; VAIL, 2007; KRICK et al., 2008), as it is a highly aggressive neoplasm in affected tissues, rapid course and occurrence of hypoalbumaemia, factors that worsen the clinical condition of the feline (KRICK et al., 2008).

REPORT OF CASE

A feline, mixed breed (SRD), 13 years old, castrated, weighing 4.2 kg, dewormed, positive for feline immunodeficiency (FIV) and up-to-date quintuple vaccine, was seen at the general small animal clinic with a complaint of apathy and inappetence for two days. The animal was reported to be vomiting semi-digested food containing hairballs. This first service is considered day zero.

On physical examination, normal colored mucous membranes were observed, capillary refill time (CPT) was measured in two seconds, semiologically palpable lymph nodes without alterations, body score three (1-5), rectal temperature (TR) 39°C, mild dehydration (6%), other parameters within the normal range for the species.

The veterinarian, responsible for the care, opted for the hospitalization of the feline for intravenous fluid therapy, blood collection for blood count and biochemical analysis, research for hemocytozoa and the performance of a total abdominal ultrasound.

Laboratory blood tests were performed. Blood count revealed normochromic macrocytic anemia and biochemicals such as alanine aminotransferase (ALT: 101 I.U./L, reference value - RV 10 to 80 I.U.), alkaline phosphatase (AP: 36 I.U./L, RV = 10 to 96 I.U./L), urea (86mg/L, RV = 35 to 60mg/L) and creatinine (1.6mg/dL, RV = 0.7 to 1.8mg/dL), with only ALT and urea resulting in values above the reference, according to hemogram and biochemistry. The hemocytozoan research test showed a negative result.

The abdominal ultrasound report showed the following changes: in the liver, the vascular architecture was increased, suggestive of liver congestion, liver overload or mild liver disease. Intestinal loops with presence of amorphous hyperechoic content and slight collection of gas in the lumen. The undulating duodenum, with a hyperechoic wall,

suggestive of duodenitis. The kidneys with an image indicative of incipient nephropathy. The urinary bladder was filled with anechoic content, with the presence of a lot of floating hyperechoic sediment, which could be associated with cystitis. The pancreas was slightly thickened, hyperechoic, suggestive of pancreatitis. The other organs were within normal limits.

During hospitalization, the cat showed a state of alert and, after the period of fluid therapy, it was more active with a significant improvement in the clinical condition, feeding and drinking water spontaneously, without episodes of pyrexia (fever), emesis or other physiological changes. He defecated and urinated normally.

With the results of the complementary exams, the feline was released (hospital discharge), with a diagnosis of mild liver disease, pancreatitis and incipient nephropathy. Observation and return recommendations for subcutaneous fluid therapy within three days. The physician in charge prescribed oral use of Omeprazole (SID, ten days), Metronidazole + sulfadimethoxine (BID, ten days), Meloxicam (SID, four days), Ondansetron (TID, three days), Acetylmethionine (BID, ten days), Sulfate ferrous (SID, 30 days) and Silymarin (BID, 30 days).

In the second visit, on the 85th, the tutor reported fever the night before (RT 39.9°C), lack of appetite for two days, episodes of vomiting of semi-digested food mixed with the hairball, every three days, for more than a week, intolerance on touch in the abdominal region, listlessness, diarrhea containing hairs, for a day, normal urination.

In the physical examination at the veterinary clinic, apathy, respiratory rate (RR), heart rate (HR) and TR were observed, within normal standards for the species and age of the feline (30 movements per minute - mpm, 200 beats per minute - bpm and

38°C, respectively), normocolored mucous membranes, semiologically palpable lymph nodes without alterations, body score 3 (1-5); 8% dehydration, pain when touched in the abdominal region and slightly palpable intestinal loops and palpable right kidney.

The feline was hospitalized for intravenous (IV) fluid therapy for 24 hours, blood collection (hemogram/biochemicals) and ultrasound of the abdominal region.

In the laboratory blood tests, the hemogram showed thrombocytopenia and hypoproteinemia and, with regard to the biochemicals, no alterations were found in the results regarding the parameters of normality for age and species. Also, an abdominal ultrasound was performed, which showed the liver with a slightly heterogeneous, hyperechoic parenchyma, suggestive of mild liver disease and lipidosis, the stomach with a wall showing thickening of the layers, and the kidneys showing a hyperechoic cortical bone, suggestive of nephropathy. In addition, the presence of a hyperechoic structure with hypoechoic nodular areas in the right caudal abdomen, not measured in the exam, was observed, presenting a reactive mesentery, an image suggestive of neoplasia, abscess or peritonitis.

During hospitalization, a febrile episode occurred, which was controlled by antipyretics. The feline remained on fluid therapy for 24 hours, active, with significant improvement in the clinical picture, ingesting food and water spontaneously, without episodes of fever or vomiting.

With the results of the complementary exams, the physician in charge indicated to the tutor that an exploratory laparotomy must be performed with the collection of material for histopathological research. The tutor did not opt for surgery, preferring to consult another professional. The animal was discharged after 24 hours of hospitalization.

On day 90, the tutor sought new care for the feline at a veterinary hospital for small animals with the purpose of confirming the ultrasound diagnosis, as well as carrying out the exploratory laparotomy suggested in the previous consultation, day 85. She presented all the blood and ultrasound tests performed previously. She reported that the cat has had a lack of appetite, apparent weight loss, emesis for more than three days, pain when touched in the abdominal region, apathy and episodes of diarrhea. The physical examination showed a marked degree of dehydration (8%), apathy, RR of 28 bpm and HR of 170 bpm, both within normal parameters for the species and age, TR 39°C, pale mucous membranes, semiologically palpable lymph nodes without alterations, body score two (1-5), pain on touch in the abdomen, slightly palpable bowel loops.

Blood collections and an abdominal ultrasound were performed as an imaging exam. Result of laboratory tests: complete blood count - normochromic microcytic anemia and lymphocytopenia; biochemical - no changes for age and species. Ultrasonography revealed the liver with increased dimensions, the gallbladder full of anechoic content with the presence of a small amount of amorphous, echodense material deposited (biliary sludge), the stomach with normal thick walls, measuring 0.15 cm, the duodenum also with thickened walls, measuring 0.24 cm, the jejunum with thickened walls, measuring between 0.26 cm and 0.47 cm, the thickest segment with loss of focal definition of the stratification of its layers, image suggestive of neoformation or inflammatory bowel disease, the colon with normothick walls, measuring 0.09 cm, the spleen with increased dimensions, slightly irregular contours, tiny hypoechogenic areas diffused through the parenchyma (lacey appearance) and slightly coarse echotexture,

image suggestive of neoplasia, splenitis, extramedullary hematopoiesis, the kidneys with mineralization. It was also observed the presence of mass in the topography of the right caudal abdomen, heterogeneous, rounded, with partially defined limits, with cavitations filled by anechogenic content, measuring approximately 3.69 cm x 2.53 cm and highly vascularized on color Doppler study, an image suggestive of neoformation. Presence of a slight amount of free fluid in the region cranial to the left kidney and around the right liver. Cardiological evaluation, imaging tests (echocardiogram), revealed: mild pulmonary valve insufficiency and abnormal pattern of relaxation in the left ventricle, compatible with the age of the animal. With the results of the exams, the veterinarian, responsible for the clinical care, prescribed the oral administration of Cyproheptadine (SID, five days).

The surgical approach, exploratory laparotomy, was scheduled for the 96th, but was suspended by decision of the oncological surgeon and rescheduled for the 109th, and was again canceled by the surgeon, with no forecast of a new date.

On the fourth visit, day 119, the guardian, in view of the suspensions and postponements of the exploratory laparotomy, the lack of predictability in the clinical-surgical-oncological care and the state and clinical condition of the feline, without therapeutic support with medicines and drugs for pain, presenting emesis and diarrhea, sought care at another veterinary clinic on an emergency basis. He presented copies of all blood tests already carried out, reporting that the feline has had daily emesis for approximately three days, with content of semi-diger and hairballs.

In the clinical examination it was observed, prostrate level of consciousness, TR 37.4 °C, weighing 3.270 kg, normal colored mucous membranes, abdominal palpation with pain,

vomiting, thoracic auscultation difficult due to the cat's purring, RR 100 bpm, FR 28mpm, blood pressure systolic pressure (SBP) of 130 mmHg, blood glucose 136 mg/dL, severe dehydration (11%), ganglia without changes, oral cavity without changes, absence of the upper right canine. The was then hospitalized for fluid therapy due to the state of dehydration. The laboratory examination, blood count, showed: moderate anisocytosis, erythrocytes in rouleaux, discreet jaundice, hypersegmented neutrophils, lymphocytopenia and thrombocytopenia. The biochemicals showed: hypokalemia, hypoalbuminaemia, elevated creatinine and urea, hyponatremia and azotemia. Ultrasonography revealed a slightly dilated common bile duct, stomach markedly dilated by liquid content, spleen with slightly irregular contours and coarse echotexture, kidneys with a thin cortical region and high echogenicity, suggesting nephropathy and increased echogenicity of the renal pelvis, suggesting fibrosis, the intestinal segments they were dilated by liquid content and thickened walls, measuring 0.55 cm (enteritis), one of the segments being markedly thickened, with non-preserved layers, measuring 0.7 cm, indicative of a severe infiltrative or inflammatory neoplastic process (Figure 1). Also, increased echogenicity of the mesentery and very discreet abdominal free fluid, the mesenteric lymph nodes were enlarged, suggesting inflammation and a 1.2 cm hypoechoic structure in the right hypogastric region, suggesting cyst or inflammation.

In view of this clinical condition of the animal; results of physical examinations; laboratory exams (hemogram and biochemistry) and total abdominal ultrasonography, the feline was hospitalized for corrections in hydration, nutrition and medication administration. The treatment, medication and food, administered daily, in

the period between days 119 and 124: Ringer Lactate (20 ml/h on the first day, followed by seven ml/h on the following days, IV), Maropitant (IV, SID), Ondasetron (IV, BID), Amoxicillin sodium + potassium clavulonate (SC, BID), Tramadol hydrochloride (SC, BID), Ranitidine (SC, BID), Pasty food (A/D Hill's®¹, via tube, TID) and Microenteral (via probe, SID).

In the feline follow-up clinical parameters overnight on day 119, the cat accepted ten grams of the feed amount, A/D Hill's®¹ in a facilitated way. On day 120, he had an episode of diarrhea, accepted a small portion of high-calorie food, 5g of A/D Hill's®¹ in the facilitated form. During the night, he had stable parameters, prostrated, urinated but did not defecate, was refusing food and was maintained on fluid therapy with potassium chloride replacement. On day 121, a complete abdominal ultrasonographic examination was performed to follow up the clinical condition of the feline, which presented kidneys with a slight loss of corticomedullary definition (compatible with senility/nephropathy), the gallbladder had a dilated bile duct of 0.44 cm in diameter, the gastric cavity and was dilated by liquid and gas content, with thickened walls, measuring about 0.37 cm thick, suggestive of an inflammatory/neoplastic process, the intestinal loops had reduced peristalsis, the duodenum and descending colon were dilated by liquid and gas content, measuring 1.02 cm and 1.39 cm in diameter (Figure 2), respectively.

In the middle/caudal abdomen, on the right side, greater thickening and loss of focal layer stratification were seen in the intestinal loop portion, measuring approximately 0.40 cm thick, suggestive of neoformation/inflammatory process (Figure 3). In the segments that could be evaluated, the thicknesses were measured, with approximately 0.28 cm in the duodenum

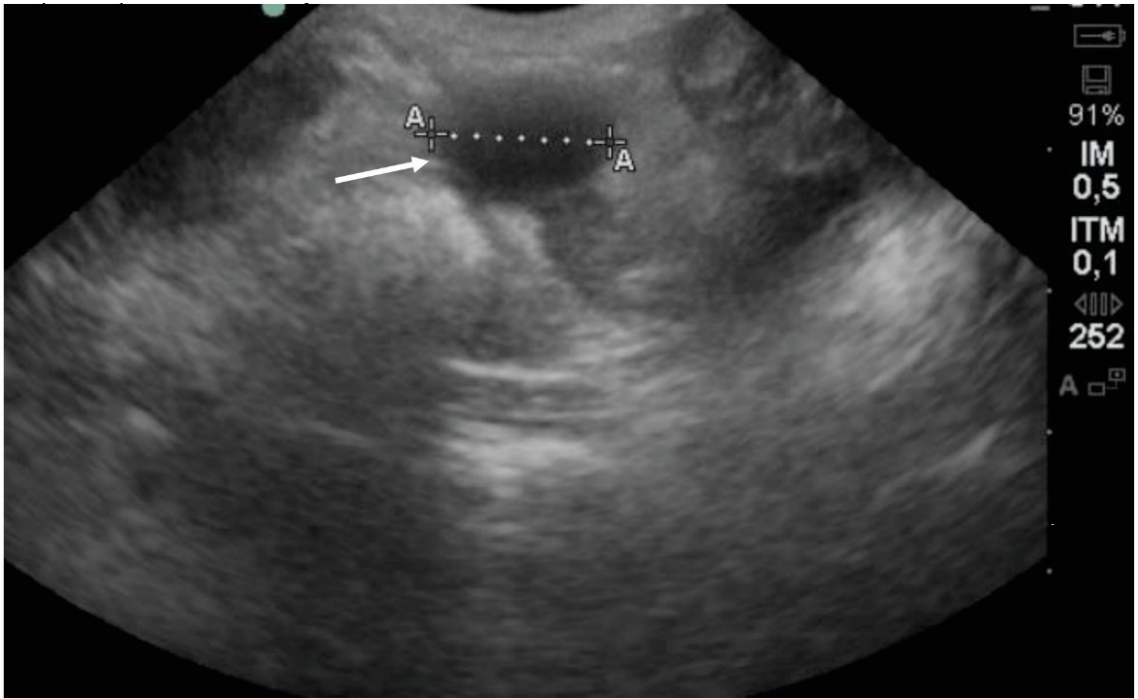


Figure 1: Ultrasound image showing an intestinal segment (white arrow) markedly thickened with non-preserved layers, measuring 0.7 cm, suggesting a severe infiltrative or inflammatory neoplastic process, in a 13-year-old SRD feline.

Source: SOUZA (2020)

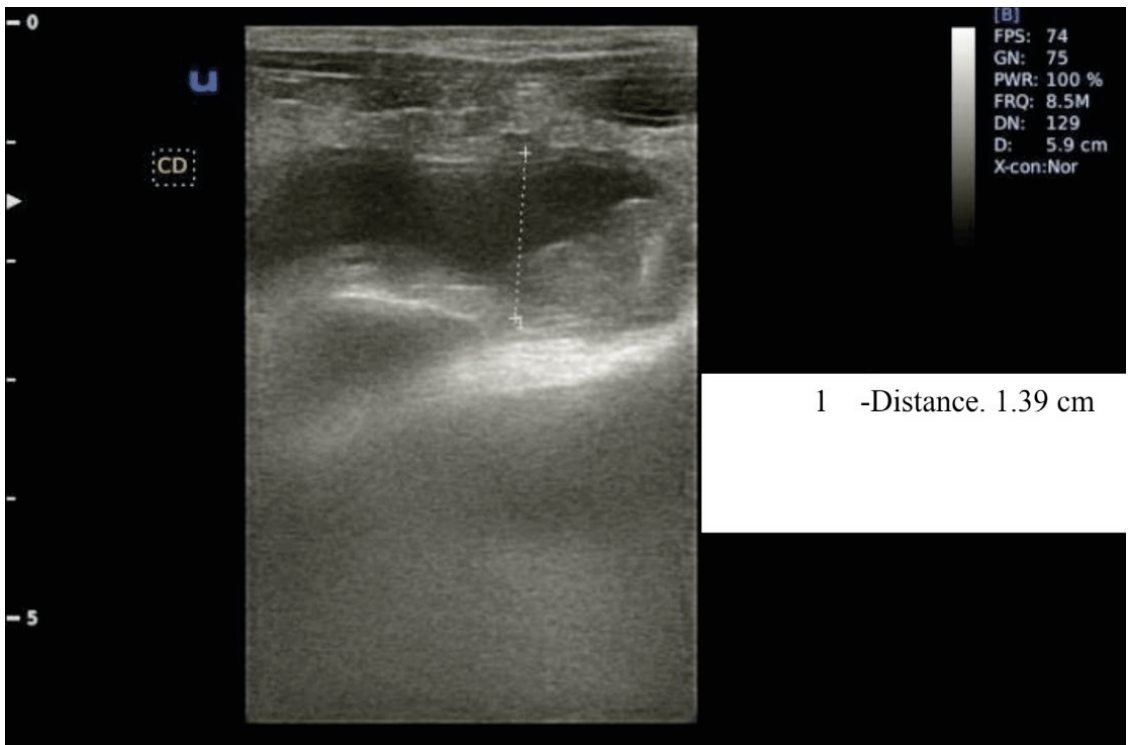


Figure 2: Abdominal ultrasound image of a feline, referring to the descending colon that is dilated by liquid and gaseous content, measuring 1.39 cm in diameter.

Source: APPEL (2020)

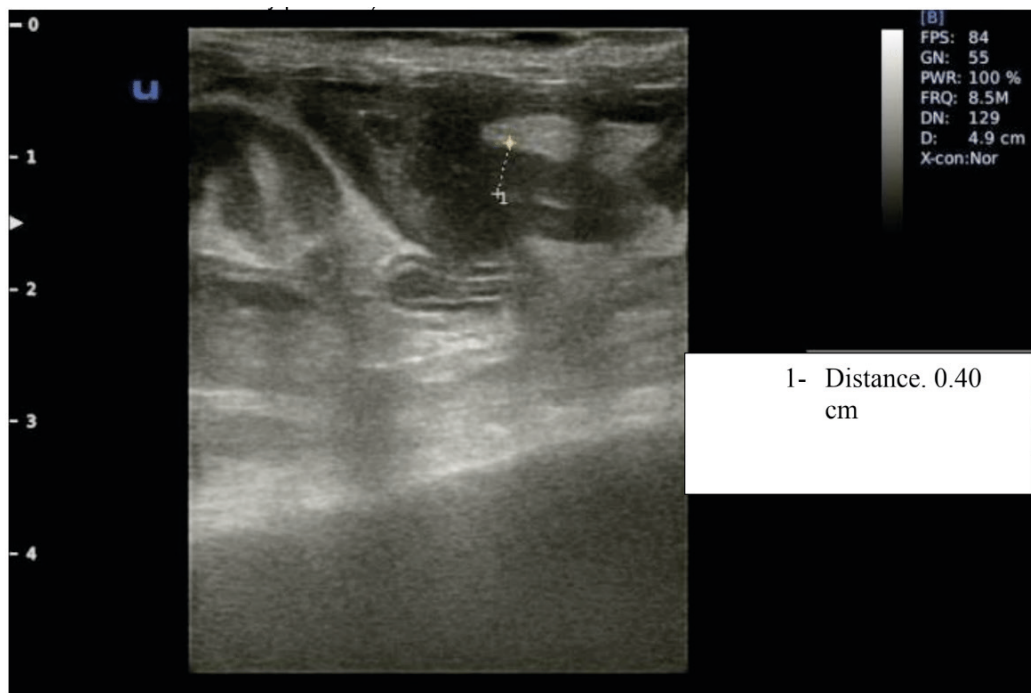


Figure 3: Image of the abdominal ultrasound of a feline, region of the middle/caudal abdomen on the right side, where a portion of the intestinal loop is visualized with greater thickening and loss of focal layer stratification, measuring about 0.40 cm in thickness (suggestive of neoformation/inflammatory process).

Source: APPEL (2020)

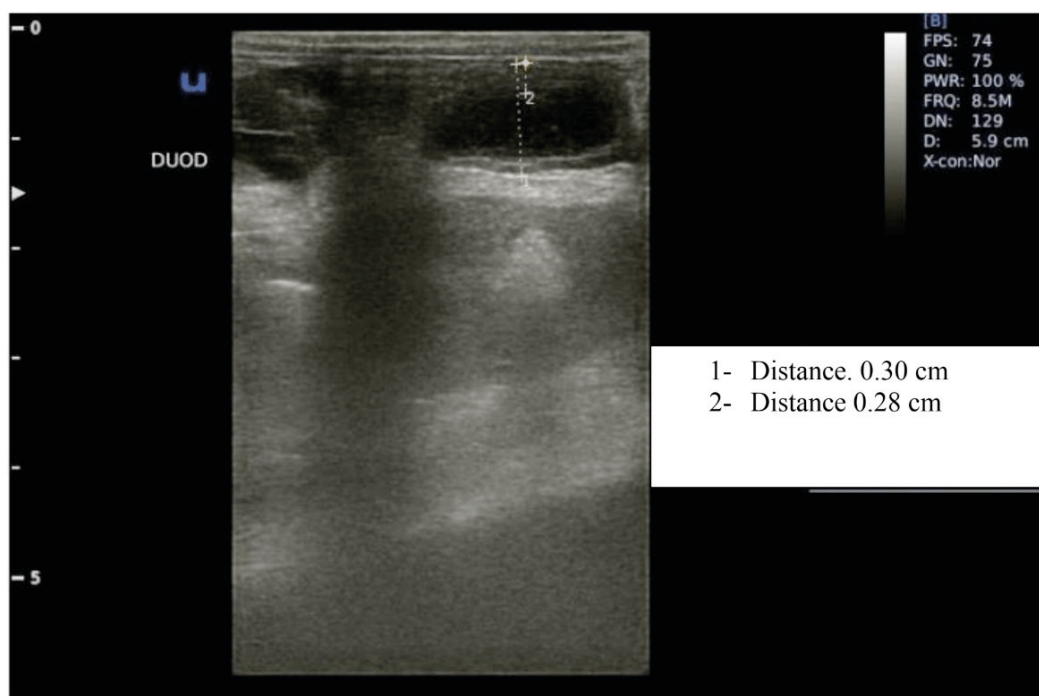


Figure 4: Abdominal ultrasound image of a feline, referring to a segment of the duodenum, measuring about 0.28 cm thick, compatible with an inflammatory/neoplastic process.

Source: APPEL (2020)

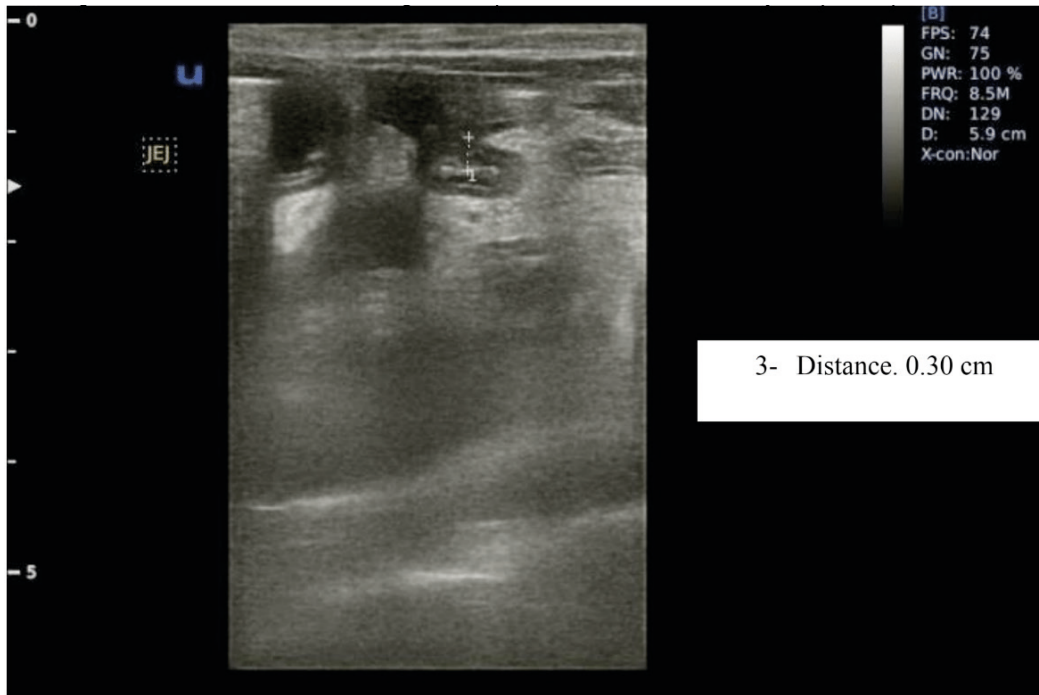


Figure 5: Abdominal US image Abdominal ultrasound image of a feline, referring to the jejunum, showing the 0.30 cm thick wall of the organ, compatible with an inflammatory/neoplastic process.

Source: APPEL (2020)

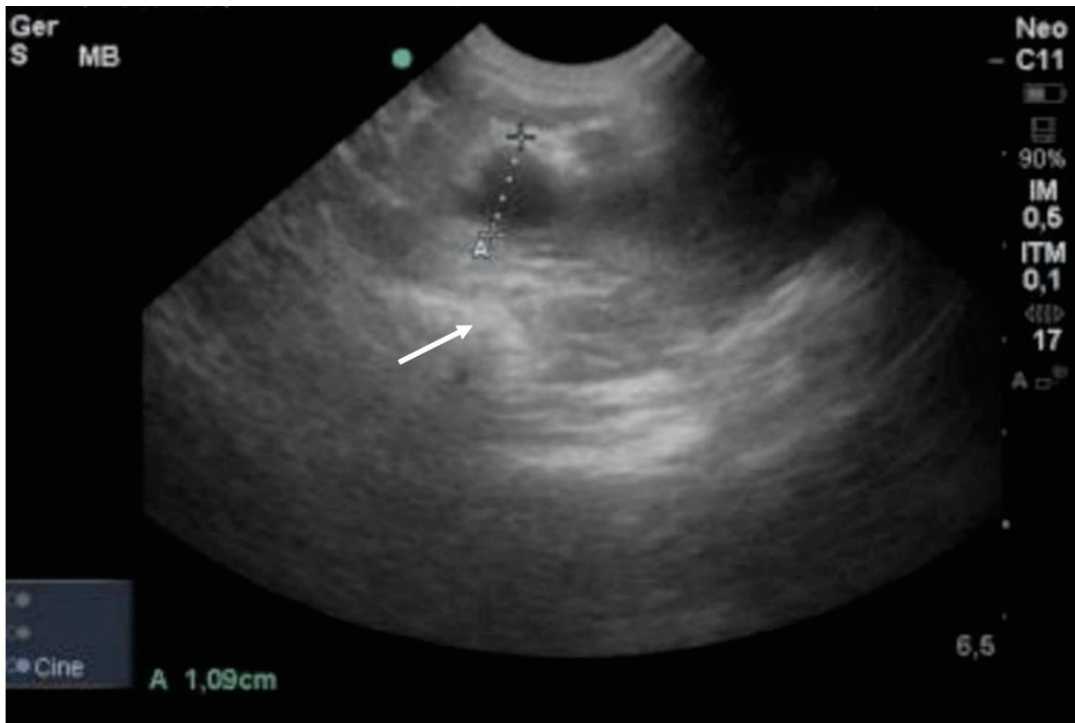


Figure 6: Ultrasonographic image of the right hypogastric region of a feline, with complaints of apathy, lack of appetite, vomiting, diarrhea and abdominal pain, showing a hypoechoic structure with rounded contours of a cyst/abscess, measuring 1.09 cm in diameter.

Source: SOUZA (2020)

(Figure 4), 0.30 cm in the jejunum (Figure 5), 0.29 cm in the ileum and 0.30 cm in the ascending colon, images being compatible with an inflammatory/neoplastic process. The mesentery showed increased echogenicity, compatible with reactivity, and the mesenteric lymph nodes were evident and enlarged. In the region of the caudal abdomen, on the right side, there was the presence of a slight amount of anechoic free fluid

On day 121, the procedure for placing an esophageal probe was performed, with the aim of improving the animal's nutritional status. The procedure was performed without any type of surgical or anesthetic intercurrent, starting feeding via tube. On day 122 the cat was conscious, alert, stable parameters, tube feeding, fluid therapy, pink mucous membranes, diarrhea in the morning. On day 123 the cat was prostrate, but with stable parameters, urinated, did not defecate. The stomach was emptied into 75 ml, where it was observed that the liquid had a green, fetid color. On the same day, a new emptying of 150 ml of greenish stomach contents was carried out, after which he presented episodes of nausea, and an infusion of metoclopramide and potassium replacement was administered. Other meals cancelled, fasting until the next morning, following fluid therapy only.

On day 124, the animal was again prostrate, but responsive to stimuli, without nausea and vomiting. 60 ml of yellowish stomach contents were emptied. Did not urinate and did not defecate. Microenteral fluid therapy was started, showing an improvement in the clinical picture, an alert, more active state of consciousness. Blood and biochemical tests were unchanged, demonstrating great clinical improvement. Hospital discharge was then released, with guidance to the tutor regarding the prescription of Amoxicillin + potassium clavulanate (BID, seven days), Omeprazole (SID, always in the morning

on an empty stomach, for 14 days), Metoclopramide hydrochloride (TID, five days), Cyproheptadine (BID, five days) and Domperidone (SID, seven days), and general care and management recommendations to monitor general disposition, temperature, appearance of stool and urine, tube handling to promote gastric emptying to every six hours and return in 48 hours for clinical evaluation and indication of exploratory laparotomy for diagnosis and intestinal biopsy.

After hospital discharge, monitoring with medication and monitoring of the main clinical signs at home continued. The feline showed active behavior, using the litter box (urinating well and without defecating), showed interest in pasty foods, sachets and water, ingesting spontaneously and in small quantities, one episode of vomiting with a dark and fetid color, normal colored mucous membranes, and without an episode of elevated rectal temperature. Tutor performed gastric emptying every six hours, of approximately 20ml of liquid, in brown color. Moderate degree of dehydration, active, normal colored mucous membranes, probe cleaning and dressing change once a day with chlorhexidine. During the period of medical discharge, an abdominal ultrasound was performed, which showed the stomach was markedly dilated due to liquid content and increased peristalsis, the spleen with reduced dimensions suggesting dehydration or hypovolemia, the cortical region of the kidneys was thin and with high echogenicity, suggestive of nephropathy. Increased echogenicity of the renal pelvis, suggestive of fibrosis. Intestinal segments dilated by liquid content and thickened walls with the presence of hyperechogenic content forming an acoustic shadow in the intestinal segment of the mesogastric region, suggesting a hairball/undigested solid food and the presence of a hypoechogenic structure with rounded

contours, located in the right hypogastric region measuring 1.09 cm, suggestive of cyst/abscess" (Figure 6).

The animal returned to the clinic on day 128, due to the worsening of its health condition, the guardian observed the feline prostrated, episode of vomiting of fetid greenish content, did not defecate in the last two days, stiffness of the limbs, cold extremities and breathing with difficulty. In the physical examination: the animal had rigid extension of the thoracic and pelvic limbs, dehydrated, little reactive pupils, anisocoria, rectal temperature 36.7°C, hypotensive, pale mucous membranes, immediately hospitalized and placed on fluid and oxygen therapy, stabilized the condition with systolic blood pressure at 90 mmHg. Blood collection was performed, where the hemogram showed discreet anisocytosis, hypochromasia, lymphocytopenia and thrombocytopenia and the biochemical analysis showed hypokalemia, hypoalbuminaemia, elevated creatinine, elevated urea, hyponatremia and azotemia.

On day 129, in the morning, the feline was prostrate, but responsive, parameters were maintained, except for systolic artery pressure (SBP) which was 80 mmHg, carried out a load test, which increased to 100 mmHg, and accepted tube feeding well. Emptying of the tube resulted in 1 ml of yellowish content. On day 130, preoperative fasting was performed. The feline had an episode of vomiting in a stream of fetid contents and odor. The animal's clinical conditions were normal: SBP (120 mmHg), FR (40 mrm) and HR (180 bpm). The surgical procedure of exploratory laparotomy was then performed, with the purpose of diagnosis and intestinal biopsy. During the procedure, liquid and fetid contents were found in the stomach; Intestine reactive jejunum region, presenting a nodule of approximately 1.5 cm in diameter, causing obstruction in this region. Partially ruptured

intestine with adhesion of the omentum, after enterectomy and collection of mesenteric lymph node fragment. Suture with nylon 4.0. No anesthetic intercurrent during the procedure. In the immediate post-operative period, at the end of the surgical procedure, significant hypotension, stabilized. In the anesthetic return, RT of 35.2°C, SBP of 70 mmHg, HR of 72 bpm and RR of 20 mpm. Ten minutes after anesthetic return, there were three cardiorespiratory arrests, all of which were reversed with cardiac massage, oxygen and intravenous adrenaline; stabilized, returned to normal cardiorespiratory patterns. Finally, three hours after surgery, he died due to cardiorespiratory arrest.

The collected fragment was sent for biopsy, which described the sample with a brownish, soft and irregular internal surface. Microscopically, it presented a neoplasm ulcerating the mucosa and invading the submucosa and the muscular layer, characterized by round cells forming homogeneous dense arrangements of cells with large, vesicular nuclei with moderate pleomorphism and central large nucleolus, scarce, eosinophilic cytoplasm and the presence of numerous mitotic figures, thus diagnosing an intestinal large cell lymphoma.

DISCUSSION

The animal of the present clinical case represents the typical profile of the feline with intestinal large cell lymphoma, presenting all the main characteristics already described in the literature for the species: male cat, castrated, mixed breed, elderly (13 years old), with symptoms of chronic and recurrent inflammatory bowel disease (IBD), episodes of emesis for periods longer than three months (WILSON, 2008; NORTH; BANKS, 2009; RECHE JR. et al 2010; BARRS; BEATTY, 2012; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016), composed of mixed

semi-digested foods appeals; discomfort and intolerance to abdominal touch, anorexia with weight loss due to malabsorption of the intestinal mucosa - nutritional insufficiency, high rates of dehydration resulting from emesis, diarrhea and lack of ingestion of water, episodes of constipation alternating with diarrhea, both containing hair mixed with the feces (SMITH, 2011; BARRIGA, 2013). On palpation, they present a focal mass or masses with thickened and easily palpable intestinal loops and splenomegaly (CALAZANS; DARECK; DE NARDI, 2016).

In the hematological exams, the cat presented anemic condition, erythrocytosis, leukocytosis, neutrophilia, lymphocytosis, thrombocytopenia, hypoalbuminemia, hypocobalaminemia, characteristic signs described in the literature that deals with food lymphomas that affect the feline species (BARRS; BEATTY, 2012; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016; BOTELHO, 2019).

As for ultrasound exams, highlight the importance of analysis, evaluation and comparison of images regarding the chronological progression of the pathology, in particular regarding changes in the layers of the stomach walls, intestinal loops and the presence of masses, at each image taken, verifying the evolution of intestinal large cell lymphoma over a short period of time, widely described in the literature involving neoplasms.

The presented stomach and intestinal layers preserved in his first ultrasound examination (day 0), which makes it difficult to distinguish between the initial neoplastic process and the inflammatory one at that moment, as described by Zwingenberger et al. (2010).

The second ultrasound report (day 85) revealed, when describing "...presence of a hyperechoic structure with hypoechoic nodular areas in the right caudal abdomen...",

indications of the presence of a tumor mass in this region, possibly alimentary lymphoma, according to Calazans, Daleck and DeNardi (2016).

In the third ultrasound examination (day 90), the following alterations were evident: "...stomach full of gaseous content (normally thick walls), duodenum with intraluminal gaseous content (slightly thickened walls), jejunum with loss of focal definition of the stratification of its layers (thick walls), colon with normo-thick walls, presence of mass in the topography of the right caudal abdomen, heterogeneous, rounded, with partially defined limits, with cavitations filled by anechogenic and highly vascularized content..." signs that corroborate the clinical picture described in the literature regarding large-cell intestinal lymphoma (GROOTERS et al., 1994; PENNINCK et al., 1994; NELSON; COUTO, 2006; BARRIGA, 2013; CALAZANS; DALECK; DE NARDI, 2016; BOTELHO, 2019).

The indication of exploratory laparotomy, suggested in the second consultation, based on the ultrasound findings, is in line with what is recommended in the literature (CALAZANS; DALECK; DE NARDI, 2016), delaying or postponing this procedure, considered the gold standard in the detection of intestinal lymphomas, generates negative consequences such as the failure of the surgical procedure itself and the adoption of a chemotherapy protocol (CALAZANS; DALECK; DE NARDI, 2016). With the rapid evolution of the disease, the feline weakens (VAIL et al., 1998; VAIL, 2007; KRICK et al., 2008). Procedures such as the placement of a gastric tube were, in the present report, an attempt to restore the nutritional condition of the feline, the neoplasm was already in an advanced stage.

Currently, oncology clinics and oncology professionals, in chemotherapy protocols COP - for dogs and cats, CHOP - for felines and

Madison-Wiscosin, use the drug prednisolone and not the prednisone referred to in the basic oncology literature cited in this work.

The positive test for the feline immunodeficiency virus (FIV), in the feline in the case report, also contributed to the worsening of the clinical condition of the animal, promoting a decrease in immunity, which already occurs even in the absence of neoplasms (CHANDLER; GASKELL; GASKELL, 2006). This aggravation is due to the indirect induction of lymphomas through the feline's weakened immune system by the joint action of other oncogenic factors present (MAGDEN; QUACKENBUSH; VANDEWOUDE, 2011).

The supportive treatment instituted in the feline of the clinical case was the most adequate possible given the clinical condition with the placement of the gastric tube, essential for the maintenance of the nutritional intake within the appropriate parameters for the species, thus preventing the accentuated loss of weight and muscle mass (MAHONY et al., 1995; VAIL; 2007; KRICK et al., 2008; BELLY, 2013).

In the treatment of the feline in question, the corrective medications for gastric disorders in general were correctly administered (AMORIM, 2008; GIEGER, 2011; BARRIGA, 2013; ORTIZ et al., 2019; NOGUEIRA; MELO, 2020), antibiotic therapy, the use of opioid drugs for pain control (YIN, et al., 2007; LOONEY, 2010), as well as the use of appetite stimulants and cobalamin supplementation in the face of hypcobalaminemia presented by the feline, a condition described in the literature as frequent in cases of alimentary lymphoma in felines (WILSON, 2008; BARRS; BEATTY, 2012; BARRIGA, 2013).

CONCLUSION

Feline veterinary medicine has achieved important advances within the small animal clinic, where treatments and procedures become more effective and safer when associated with the use of technology in prior diagnosis, aiming at the staging of many types of neoplastic pathologies. Unfortunately, the delay in carrying out the surgical procedure, both in terms of the tutor's delay in authorizing the exploratory laparotomy surgery and in rescheduling the dates, culminated in the delay in diagnosing the lymphoma, resulting in a delay in the correct treatment for the pathology. In addition, several associated factors, such as the advanced age of the feline, the weakened nutritional status, the feline being FIV positive and the type of lymphoma, aggressive and with a rapid course, made the resection of the neoplastic tissue unfeasible and, perhaps, possible or remote, an attempt application of an appropriate chemotherapy protocol, ensuring a period of survival for the cat in the case report. Still, regarding animal welfare, we verified in the feline's medical record that there was no adoption of pain medication, an indication recommended in the bibliography as a supportive treatment. The dynamics in early diagnosis and adequate treatment is a constant reality in animal medicine. It is expected that small animal veterinary medicine professionals continue to study the subject of neoplasms in general, improving techniques and protocols with regard to clinical, laboratory, imaging and chemotherapeutic examinations in general, seeking the well-being of the oncological animal.

MANUFACTURERS

¹ A/D Hill's®- Hill's Pet Nutrition Prescription Diet

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