NEOPLASTIC EFFUSION IN A CAT POSITIVE FOR FELINE LEUKEMIA VIRUS: A CASE REPORT

Efusão neoplásica em um gato positivo para o vírus da leucemia felina: relato de caso

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Abstract

Lymphoma is a hematopoietic neoplasm resulting from the proliferation of lymphoid cells, and can affect domestic cats of any age, sex, or breed. Among the main risk factors are infection with feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV). This report aims to describe the clinical presentation and diagnostic findings of a feline with pleural effusion secondary to lymphoma. A feline was seen at a veterinary hospital presenting with altered respiratory pattern, lethargy, and anorexia. Chest radiography revealed the presence of pleural effusion, and cytological analysis showed high cellularity with a predominance of intermediate and large lymphocytes. The combination of clinical examination, history, and imaging studies was fundamental for the diagnosis. Due to the patient's advanced clinical condition, treatment could not be initiated, highlighting the importance of a rapid and thorough assessment of respiratory signs in cats.

Keywords: Neoplasia. Mediastinum. Cytology. Lymphoma.

Resumo

O linfoma é uma neoplasia hematopoiética originada pela proliferação de células linfoides, podendo acometer felinos domésticos de qualquer idade, sexo ou raça. Entre os principais fatores de risco estão a infecção pelo vírus da leucemia felina (FeLV) e pelo vírus da imunodeficiência felina (FIV). O presente relato teve como objetivo descrever a apresentação clínica e os achados diagnósticos de uma felina com efusão pleural secundária a linfoma. Uma felina foi atendida em um hospital veterinário apresentando alteração no padrão respiratório, apatia e anorexia. O exame radiográfico do tórax revelou a presença de efusão pleural e a análise citológica demonstrou elevada celularidade com predomínio de

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linfócitos intermediários e grandes. A associação de exame clínico, histórico e exames de imagem foi fundamental para o diagnóstico. Devido ao quadro clínico avançado da paciente, não foi possível iniciar o tratamento, ressaltando a importância de uma avaliação rápida e criteriosa de sinais respiratórios em gatos.

Palavras-chave: Neoplasia. Mediastino. Citologia. Linfoma.

Introduction

Lymphoma is considered a common neoplasm in domestic cats, accounting for up to 90 percent of hematopoietic neoplasms and approximately one third of all tumors in this species (Horta *et al*., 2021). It is characterized as a malignant neoplasm that may affect organs such as the liver, spleen, lymph nodes, intestines, kidneys, central nervous system, bone marrow, and other solid lymphoid organs. Based on anatomical presentation, it is classified as extranodal, multicentric, alimentary, or mediastinal (Silva *et al*., 2020). This disease is highly relevant in Veterinary Medicine, and early and accurate diagnosis is essential to ensure an improved prognosis and appropriate treatment.

Several factors may contribute to the development of lymphoma in domestic cats, including retroviral diseases (Fabrizio *et al*., 2014; Horta *et al*., 2021). Feline leukemia virus (FeLV) is a retrovirus responsible for infections, tumor development, and immunological dysfunction. The formation of virus-related neoplasms occurs through insertion of viral genetic material into the host genome in regions adjacent to cellular oncogenes, altering cell growth and leading to somatic genetic mutations that promote the clonal expansion of abnormal cells (Abdollahi-Pirbazani *et al*., 2019).

The survival time of FeLV-positive patients affected by lymphoma is generally approximately six months, with a remission time of around four months when chemotherapy is instituted (Paier; Senhorello; Lutzke, 2023). Due to the aggressive nature of the disease and its limited response to treatment, the prognosis is unfavorable.

The objective of this study was to describe the clinical presentation and diagnostic findings of a female cat with pleural effusion secondary to lymphoma, highlighting the relevance of this report to veterinary practice, particularly in the recognition of this pathology, the formulation of differential diagnoses, and clinical decision-making in cases of respiratory disorders associated with neoplasms.

Case Description

A five-year-old intact female cat was presented to a private veterinary hospital in the city of Recife, Pernambuco, with a primary complaint of altered respiratory pattern associated with hyporexia. On physical examination, pale mucous membranes, mildly abdominal breathing, and muffled heart and lung sounds were observed. The patient was normothermic and normohydrated. During anamnesis, it was reported that the cat lived with other animals and had free access to the outdoors.

At the initial consultation, blood samples were collected for complete blood count, biochemical analysis, and the Snap Combo IDEXX® rapid test, which detects FeLV antigens and feline immunodeficiency virus antibodies. The patient tested positive for FeLV. The complete blood count revealed anemia with a hematocrit of 17 percent, marked leukocytosis

due to lymphocytosis, and thrombocytopenia. Morphological evaluation showed a predominance of intermediate to large lymphoid cells, some displaying intensely basophilic cytoplasm and prominent nucleoli. Serum biochemistry showed no abnormalities: urea 28 milligrams per deciliter, creatinine 1.0 milligram per deciliter, alanine aminotransferase 65 international units per liter, and alkaline phosphatase 80 international units per liter.

Given the anemic condition, the patient was admitted for hospitalization to undergo blood transfusion and was maintained on fluid therapy and oxygen therapy. Initial treatment consisted of prednisolone (5 milligrams) and acetylcysteine (40 milligrams). On the second day of hospitalization, the animal was hypoactive but responsive to handling, with body temperature within normal limits and persistently pale mucous membranes. A new blood sample was collected to monitor the anemic condition, revealing a further decrease in hematocrit and persistent leukocytosis with the presence of atypical lymphoid cells (Table 1).

Table 1 – Results of complete blood counts performed on the first day of care and after 24 hours of hospitalization

	1st Blood Count	2nd Blood Count	Reference
Red Blood Cells (millions /mm3)	4.3	2.5	5.0 – 10.0
Hemoglobin (g%)	6.0	3.2	8.0 – 15.0
Hematocrit (%)	17.0	10.0	24.0 – 45.0
VCM (u3)	41.8	40.0	39.0 – 55.0
CHCM %	33.3	32.0	30.0 – 36.0
Total Leukocytes (/mm3)	201.600	131.200	5.500 – 19.500
Band Neutrophils (/mm3)	2.016	0	0 – 585
Segmented Neutrophils (/mm3)	4.032	2.624	1.925 – 14.625
Eosinophils (/mm3)	0	0	110 – 2.340
Lymphocytes (/mm3)	193.536	128.576	01.100 – 10.725
Monocytes (/mm3)	2.016	0	55 – 780

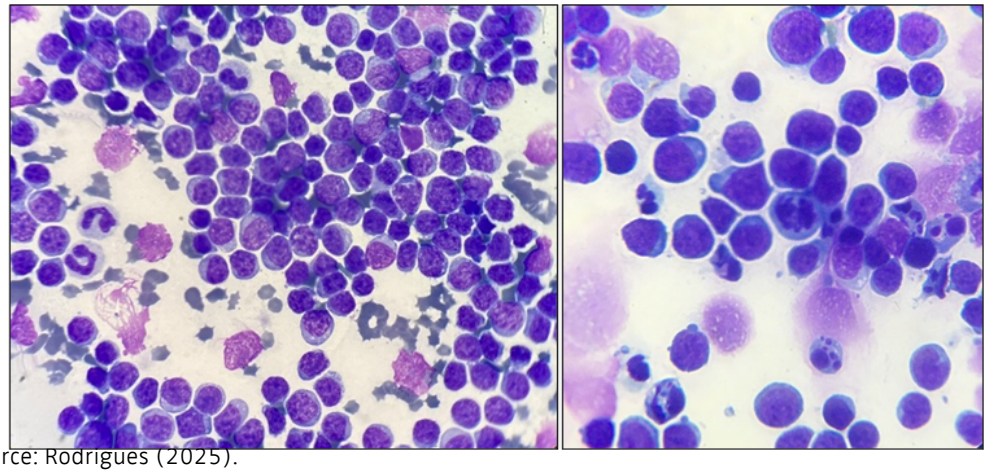
T Source: Rodrigues (2025).

Thoracic radiographic examination revealed cranial mediastinal widening and the presence of a mediastinal mass, in addition to a moderate volume of pleural effusion, predominantly affecting the right hemithorax. Thoracocentesis was performed, yielding approximately 100 milliliters of effusion, which was submitted for cytological analysis. Abdominal ultrasonography demonstrated severely enlarged intra-abdominal lymph nodes, splenomegaly, and splenitis.

Cytological evaluation of the pleural effusion revealed high cellularity, with a predominant population of individualized intermediate to large lymphocytes. These cells exhibited a variable increase in the nucleus-to-cytoplasm ratio, with scant to moderate

cytoplasm, showing moderate to intense basophilia and occasional cytoplasmic vacuoles. The nuclei were round to irregular, mostly eccentrically located, with coarse to finely granular chromatin. Nucleoli were predominantly single, centrally to peripherally located; macronucleoli and marked anisokaryosis were also observed. Approximately two to four mitotic figures per 400× field were identified (Figure 1A and 1B). Based on the laboratory findings, the conclusion was lymphomatous effusion.

Figure 1 – Cytological Analysis of Pleural Effusion



Source: Rodrigues (2025).

Note: (A) Cytological analysis of pleural effusion from a five-year-old domestic cat, demonstrating high cellularity with predominance of large lymphoid cells, 400× magnification. (B) Mitotic figure, 1000× magnification.

A worsening of the patient's clinical condition was observed. The animal remained hypoactive, poorly responsive, and unwilling to eat spontaneously. Due to clinical instability, initiation of oncological treatment was not feasible. After 48 hours of hospitalization, the patient progressed to cardiopulmonary arrest and died.

Discussion

Feline leukemia virus may act as a carcinogen by altering oncogenes and producing oncoproteins that interfere with cellular regulation, causing mutations and leading to the development of lymphoma and other neoplasms in cats (Horta *et al*., 2021; Rolph; Cavanaugh, 2022). Transmission occurs through direct contact between cats and may take place vertically, from queens to their offspring, or horizontally (Little *et al*., 2020). Cohabitation with animals of unknown health status and free access to the outdoors may have constituted predisposing factors in this case, given the increased risk of direct transmission.

Patients with mediastinal lymphoma commonly present clinical signs such as dyspnea, inappetence, regurgitation, coughing, pyrexia, and anorexia. A study conducted by Fabrizio *et al*. (2014) identified that 51% of the evaluated animals also presented pleural effusion. The case described in this report is consistent with these findings, since, although the patient did not exhibit signs of dyspnea at any time, it showed inappetence, anorexia, mild respiratory discomfort, and pleural effusion.

A whole blood transfusion was performed due to severe anemia. The patient exhibited normocytic, normochromic anemia associated with an inflammatory process, also referred to as anemia of chronic disease, a common condition that ranges from moderate to severe in cases of mediastinal lymphoma (Jark; Rodrigues, 2022).

The diagnosis of lymphoma is typically established by identifying lymphoblasts through cytological analysis of effusion fluid, samples obtained from the mediastinal mass, or lymph nodes (Shih; Brenn; Schrope, 2014). For a definitive diagnosis, in addition to visualization of the thoracic mass on radiographic examination, cytological analysis of the effusion was of critical importance, as round cell neoplasms readily exfoliate. A neoplastic effusion secondary to high-grade lymphoma is cytologically characterized by a monomorphic population of lymphoblasts, which are large cells with scant to moderate amounts of basophilic cytoplasm, eccentrically located round and variably shaped nuclei, finely stippled nuclear chromatin, and prominent nucleoli (Boes, 2024).

In FeLV-positive patients, hematopoietic neoplastic disorders such as leukemias may also occur, either primarily or secondary to bone marrow involvement by lymphoma (Thrall *et al*., 2014). A Brazilian study correlating FeLV infection with lymphoma development evaluated 53 cats diagnosed with lymphoma and found that 56.6 percent were immunopositive for FeLV, with multicentric and mediastinal lymphomas being the most prevalent forms (Cristo *et al*., 2019).

The patient presented a lymphoid cell count of 193,300 per cubic millimeter on the complete blood count performed on the first day of care, along with morphological alterations observed during peripheral blood smear evaluation. According to Thrall *et al*. (2014), during the leukemic phase of lymphoma, lymphoblasts may be detected in peripheral blood and bone marrow. Furthermore, as reported by Jark and Rodrigues (2022), involvement of the hematopoietic system and neoplastic infiltration of the bone marrow may occur in all cats with lymphoma, regardless of anatomical location.

The diagnosis and treatment of mediastinal lymphoma remain challenging in veterinary oncology due to difficulties in early detection, delayed initiation of therapy, and consequently, the unfavorable prognosis observed in affected animals (Oriekhova; Shchebentovska, 2022).

In case reports in which chemotherapeutic treatment can be instituted, the primary objective is to prolong patient survival, as there is no curative therapy. However, even with early initiation of chemotherapy, achieving a favorable outcome may be challenging, since therapeutic response is directly related to the patient's clinical status, tumor staging, and the extent of systemic involvement at the time of diagnosis. In many cases, advanced lymphoma progression, combined with complications such as pleural effusion, anemia, and chronic inflammatory status, limits treatment efficacy and worsens prognosis (Cápua *et al*., 2005; Schimanski; Moraes; Moya, 2023).

Delayed identification of the neoplasm, together with the presence of comorbidities, has a significant negative impact on clinical outcome, underscoring the importance of early diagnosis and individualized management as key strategies to optimize therapeutic results. In this context, thorough investigation of cavitary effusions in oncologic patients becomes increasingly relevant, as it contributes to clarification of the clinical condition and appropriate medical decision-making.

The present case highlights the essential role of complementary diagnostic methods, including thoracic radiography, ultrasonography, cytological evaluation of cavitary fluids, and retroviral testing, in achieving an accurate diagnosis and supporting more

assertive therapeutic decisions. Early and integrated use of these examinations assists in establishing differential diagnoses for pleural effusion, a condition with multifactorial etiology, and reinforces the importance of preventive strategies and regular clinical monitoring, particularly in patients with risk factors, aiming at early disease detection and improved prognosis.

Conclusions

Integration of clinical examination, patient history, and imaging studies proved fundamental for diagnostic definition. In the present case, cytological analysis of the pleural effusion stood out as a rapid and conclusive auxiliary method, enabling identification of mediastinal lymphoma and providing essential support for clinical decision-making. This report emphasizes the importance of early diagnosis and continuous monitoring of feline patients with risk factors, reinforcing that systematic evaluation of cavitary effusions not only contributes to early detection of neoplasms but also guides individualized management, assisting in the prevention of complications and optimization of prognosis in oncologic patients. &

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