CLINICAL CASE

# Clinical case report: Feline chronic gingivostomatitis among 12 cats in Colombia

## *Informe de caso clínico: Gingivoestomatitis crónica felina en 12 gatos en Colombia*

## *Relato de caso clínico: Gingivoestomatitis crônica felina em 12 gatos na Colômbia*

Mauricio Sánchez-V[1]*; Paula Vélez-Velásquez[2]; Nathalia M Correa-Valencia[1]

[1]*CENTAURO Research Group, School of Veterinary Medicine, Faculty of Agricultural Sciences, Universidad de Antioquia, UdeA, 050034, Carrera 75 #65-87, Medellín, Colombia.*

[2]*Private practice (Medellín, Colombia).*

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***Corresponding author:** Mauricio Sánchez-V. Escuela de Medicina Veterinaria, Facultad de Ciencias Agrarias, Universidad de Antioquia, AA1226, Calle 70 No. 52-21, Medellín, Colombia. E-mail: mandres.sanchez@udea.edu.co



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## Abstract

**Anamnesis:** A descriptive series of 12 cats diagnosed with feline chronic gingivostomatitis (FCGS) described the lesions and clinical features. Two of them were treated with surgical tooth extraction. **Clinical findings:** All patients exhibited generalized gingivitis and marked halitosis, and four of them presented proliferative tissue. Seven cats tested positive for *Bartonella* spp. through molecular testing (qPCR), two tested positive for *Mycoplasma* spp., two tested positive for *Hepatozoon* spp., and one tested positive for filaria. Three patients tested positive for at least two hemopathogens. All the patients tested negative for *Babesia* spp. and Rickettsiales. **Therapeutic approach:** Among all the patients, two (patients 4 and 7) underwent the surgical treatment of choice for the disease, which involved partial extraction of incisors, premolars, and molars, according to the recommendations of the specialist veterinarian and with the consent of the owners. **Results and conclusion:** Successful results were defined for surgical treatment in both cats, with proper healing and increased food intake during the first 2 weeks of posttreatment.

**Keywords**: *cat; dental extraction; FCGS; feline chronic gingivostomatitis; oral pain; veterinary odontology.*

## Resumen

**Anamnesis:** Una serie descriptiva de 12 gatos con diagnóstico de gingivoestomatitis crónica felina (GECF), describiendo las lesiones y características clínicas. Dos de ellos fueron tratados con extracción quirúrgica de dientes. **Hallazgos clínicos:** Todos los pacientes presentaron gingivitis generalizada y marcada halitosis, y cuatro de ellos presentaron tejido proliferativo. Siete gatos resultaron positivos para *Bartonella* spp. mediante pruebas moleculares (qPCR), dos resultaron positivos para *Mycoplasma* spp., dos para *Hepatozoon* spp., y uno para filaria. Tres pacientes resultaron positivos para al menos dos hemopatógenos y todos resultaron negativos para *Babesia* spp. y Rickettsiales. **Enfoque terapéutico:** De los pacientes, dos (pacientes 4 y 7) recibieron el tratamiento quirúrgico de elección para la enfermedad, que consistió en la extracción parcial de incisivos, premolares y molares, según las indicaciones del médico veterinario especialista y con el consentimiento de los tutores.

**Resultados y conclusión:** Se definieron como exitosos los resultados del tratamiento quirúrgico en los dos gatos, con cicatrización adecuada y aumento en el consumo de alimento durante las primeras 2 semanas posteriores al tratamiento.
**Palabras clave:** *dolor oral; extracción dental; gato; GECF; gingivoestomatitis crónica felina; odontología veterinaria.*

## Resumo

**Anamnese:** Uma série descritiva de 12 casos de gatos com diagnóstico de gengivoestomatite crônica felina (GECF), descrevendo as lesões e características clínicas. Dois deles foram tratados com extração dentária cirúrgica. **Achados clínicos:** Todos os pacientes apresentaram gengivite generalizada e halitose acentuada, e quatro deles apresentaram tecido proliferativo. Sete gatos testaram positivo para *Bartonella* spp. através de testes moleculares (qPCR), dois testaram positivo para *Mycoplasma* spp., dois para *Hepatozoon* spp., e um para filária. Três pacientes testaram positivo para pelo menos dois hemopatógenos. Todos testaram negativo para *Babesia* spp. e Riquetsiais. **Abordagem terapêutica:** Dos pacientes, dois (pacientes 4 e 7) passaram pelo tratamento cirúrgico escolhido para a doença, que consistiu na extração parcial de incisivos, pré-molares e molares, de acordo com as recomendações do veterinário especialista e com o consentimento dos tutores. **Resultados e conclusão:** Os resultados do tratamento cirúrgico foram considerados bem-sucedidos nos dois gatos, com cicatrização adequada e aumento no consumo de alimento durante as primeiras 2 semanas após o tratamento.
**Palavras-chave:** *dor oral; extração dentária; gato; GECF; gingivoestomatitis crônica felina; odontologia veterinária.*

## Introduction

Feline chronic gingivostomatitis (FCGS) is a severe chronic inflammatory disease of the oral mucosa that affects domestic cats. The disease presents with erosive or proliferative lesions, accompanied by inflammation and ulceration of the gums, tongue, and palatoglossal folds (Lee *et al.,* 2020). It causes severe oral pain and can be potentially life-threatening in at least 10% of cases (Soltero-Rivera *et al.,* 2024).

The cause of FCGS remains unclear despite extensive research into its etiology. Its association with infectious agents has been suggested, although no causal relationship has been proven. These include pathogens such as feline calicivirus (FCV), feline herpesvirus type 1 (FHV-1), feline immunodeficiency virus (FIV), and feline leukemia virus (FeLV) and hemoparasites such as certain *Bartonella* species (Lee *et al.,* 2020). Other suggested factors include the oral bacterial flora profile, dietary influences, hypersensitivity to dental plaque antigens, and the immunological status of the cat; however, the exact pathogenesis of this condition is still not well understood (Kornya *et al.,* 2014).

FCGS lesions can occur in multiple areas of the mouth, from the gums to the pharynx, including the tongue, soft palate, hard palate, alveolar mucosa, and caudal buccal mucosa (Kim *et al.,* 2023). Two clinical phenotypes of the disease have been identified (i.e., ulcerative and proliferative), although both may be observed in some patients. Affected cats show clinical signs such as anorexia, severe halitosis, excessive salivation, reduced or absent grooming, decreased socialization, and weight loss due to intense pain. In some cases, weakness may be pronounced, and treatment is challenging, with euthanasia sometimes considered (Soltero-Rivera *et al*., 2023).

The disease is characterized by bilateral inflammation of the mucosa in the caudal oral cavity, distinguishing FCGS from other oral pathologies. Histopathology serves as a useful diagnostic tool for FCGS, although confirmation is based on identifying the clinical characteristics of the lesions while ruling out neoplastic conditions. The oral mucosa of cats with FCGS displays more severe inflammation than does that of cats with dental diseases or calculus accumulation. When these inflammatory lesions extend beyond the gingival mucosa, a diagnosis of FCGS is made (Kim *et al*., 2023).

The use of antimicrobial, anti-inflammatory, or analgesic medications has been reported in the management of the disease, although long-term resolution of associated signs is unlikely. Reducing dental plaque through professional cleaning and at-home oral hygiene may help, but this is difficult to maintain over time, and chronic inflammation often persists. Currently, removing plaque-retentive surfaces through tooth extraction is considered the most effective method to reduce or eliminate oral inflammation related to the disease (Jennings *et al.,* 2015). The recommended treatment begins with controlling inflammation, infection, and pain and concludes with partial (i.e., incisors, premolars, molars) or full (i.e., incisors, canines,

premolars, molars) dental extraction. This approach has a success rate of 70-80%, providing the best long-term outcomes, although in some cases, improvement is minimal or absent (approximately 20-30% of cats). In such cases, medical treatment with immunosuppressive (e.g., triamcinolone acetonide) or immunomodulatory (e.g., cyclosporine) drugs remains an option (Soltero-Rivera *et al.*, 2023).

Although veterinary odontology has advanced over recent decades, further understanding of FCGS and its treatment remains necessary. This report aims to describe the lesions and clinical features of 12 patients with FCGS treated with surgical tooth extraction. To the author's knowledge, this is the first study of its kind in veterinary medicine.

## Case series description

### *Ethical considerations*

The work described in this manuscript involved the use of nonexperimental and owned animals, and procedures are included in those internationally established as the 'best practice' of veterinary clinical care for the individual patient. Informed consent (verbal or written) was obtained from the owners or legal custodians of all the animals described in this work for all the procedure(s) performed. No animals or people are identifiable within this publication; therefore, additional informed consent for publication was not needed.

### *Patient examination*

Twelve (12) neutered domestic-owned cats (7 females and 5 males) were attended at three different veterinary clinics in the city of Medellín (Antioquia Province, Colombia) between March 2022 and November 2023. One of the patients was a purebred Maine Coon, whereas the remaining 11 were mixed breed. The recorded ages of 11 of the 12 cats ranged from 1.3-9 years, with a mean age of 5 years. The age of one individual was not recorded (Table 1). Eleven (11) of the patients presented for specialized consultation in veterinary dentistry due to difficulty in feeding, and one of them additionally presented lesions on the palmar and plantar pads. The other case involved a possible refractoriness to initial dental extraction treatment for the disease, with the re-emergence of inappetence and pain while eating. A complete anamnesis and physical examination were performed on each patient, as were routine paraclinical tests.

Additionally, molecular tests via qPCR were indicated for the diagnosis of hemotropic pathogens (i.e., *Bartonella* spp., *Mycoplasma* spp., *Hepatozoon* spp., Rickettsiales, and filaria) in all patients. Both DNA extraction and qPCR protocols were conducted according to standardized laboratory procedures.

Among all patients, two (patients 4 and 7) underwent the surgical treatment of choice for the disease, specifically partial dental extraction of incisors, premolars, and molars, in accordance with the recommendations of the treating veterinary specialist and with the consent of the owners.

*Surgical and therapeutic approaches*

The surgical procedure was performed under general anesthesia, with specific premedication according to the patient, using fentanyl (at 2 µg/kg BW, IM; Sanderson S.A., San Joaquín, Chile), acepromazine (at 0.02 mg/kg BW, IM; Tranquilan®, ZOO S.A.S., Medellín, Colombia), and dexmedetomidine (at 1-2 µg/kg BW, IM; ADS PHARMA S.A.S., Bogotá D.C., Colombia). Anesthetic induction was achieved with propofol (1% Propofol®, Braun, Bogotá D.C., Colombia), which was adjusted to a dose-effect basis (3-6 mg/kg BW, IV). All patients were intubated, and anesthesia was maintained with isoflurane (Isoflurano®, Baxter, Cali, Colombia). A bilateral block of the infraorbital and mandibular nerves was performed using 0.5% bupivacaine (0.1 ml/kg BW; PISA S.A., Guadalajara, Mexico). During surgery, tramadol (1 mg/kg BW, IM or SC; Pharmayect S.A., Bogotá D.C., Colombia) and meloxicam (0.2 mg/kg BW, IV; Meloxic® injectable solution, Provet, Bogotá D.C., Colombia) were administered for analgesia.

Both patients were operated on by the same veterinary dental surgeon veterinarian with practice limited to dentistry. A desmotomy was performed around the dental structures via a scalpel (No. 3 handle and No. 15 blade) and a periodontal elevator. The soft tissue was completely detached via the elevator, followed by vestibular osteotomy (closed technique). Odontosection of birooted and multirooted teeth was carried out, along with the luxation of each root. If necessary, the bony margins were smoothed. Suturing was performed with simple interrupted sutures using Vicryl® 3-0 (Ethicon, Johnson & Johnson, Ohio, USA).

Postoperative treatment included outpatient analgesia with pregabalin (Lyrica®, Pfizer, New York, USA) at 3 mg/kg BW once daily for 7 days and meloxicam at 0.15% (0.1 mg/kg BW, once daily for 5 consecutive days; Meloxic® drops, Provet, Bogotá D.C., Colombia). The use of a long-acting antibiotic was considered as needed based on the discretion of the treating veterinary dental surgeon.

In the case of surgical treatment, a successful outcome was defined as cats showing adequate healing and increased food intake due to the absence of pain during the first week posttreatment. Each patient was evaluated one week after surgery, and in both cases, good healing was reported. In both cases, the owners noted an increase in food consumption and an improved demeanor and mood of their pets. A soft diet was provided for one more week.

*Data analysis*

Demographic data (e.g., breed, sex, and age) were collected. The data were manually recorded in Excel spreadsheets (Microsoft Corp., Redmond, WA, USA) for descriptive statistical analysis of all the variables of interest.

## Results

All patients exhibited generalized gingivitis and marked halitosis. Four of them presented proliferative tissue —three in the oropharyngeal area and one in the retromolar region. Figure 1 presents examples of both situations. Seven cats tested positive for *Bartonella* spp. through molecular testing (qPCR), two tested positive for *Mycoplasma* spp., two tested positive for *Hepatozoon* spp., and one tested positive for filaria. Three patients tested positive for at least two hemopathogens and all tested negative for *Babesia* spp. and Rickettsiales (Table 1).

**Table 1**. Characterization of the study patients (n = 12)

| **Patient** | **Breed** | **Sex** | **Age in years** | **Diet** | ***Bartonella* spp.** | ***Mycoplasma* spp.** | ***Hepatozoon* spp.** | **Filarias** |
|---|---|---|---|---|---|---|---|---|
| 1 | Mixed | Female | 7 | B.A.R.F. | Negative | Negative | Positive | Negative |
| 2 | Mixed | Female | 4 | NR | Positive | Negative | Negative | Negative |
| 3 | Maine Coon | Female | 1.3 | NR | Positive | Negative | Negative | Positive |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4* | Mixed | Male | 6 | CCBF | Negative | Negative | Negative | Negative |
| 5 | Mixed | Male | 5 | NR | Positive | Positive | Negative | Negative |
| 6 | Mixed | Female | 4 | CCBF | Negative | Positive | Positive | Negative |
| 7* | Mixed | Male | NR | CCBF | Negative | Negative | Negative | Negative |
| 8 | Mixed | Female | 2.1 | NR | Positive | Negative | Negative | Negative |
| 9 | Mixed | Female | 5 | NR | Negative | Negative | Negative | Negative |
| 10 | Mixed | Female | 7.6 | CCBF | Positive | Negative | Negative | Negative |
| 11 | Mixed | Male | 3.7 | CCBF | Positive | Negative | Negative | Negative |
| 12 | Mixed | Male | 9 | CCBF | Positive | Negative | Negative | Negative |

*Patients underwent surgical treatment; B.A.R.F.= Biologically appropriate raw feed, a diet based on raw and natural foods, including meat, bones, organs, and vegetables, with the aim of mimicking what animals would eat in the wild; CCBF= commercial cat balanced feed; NR= Not reported.

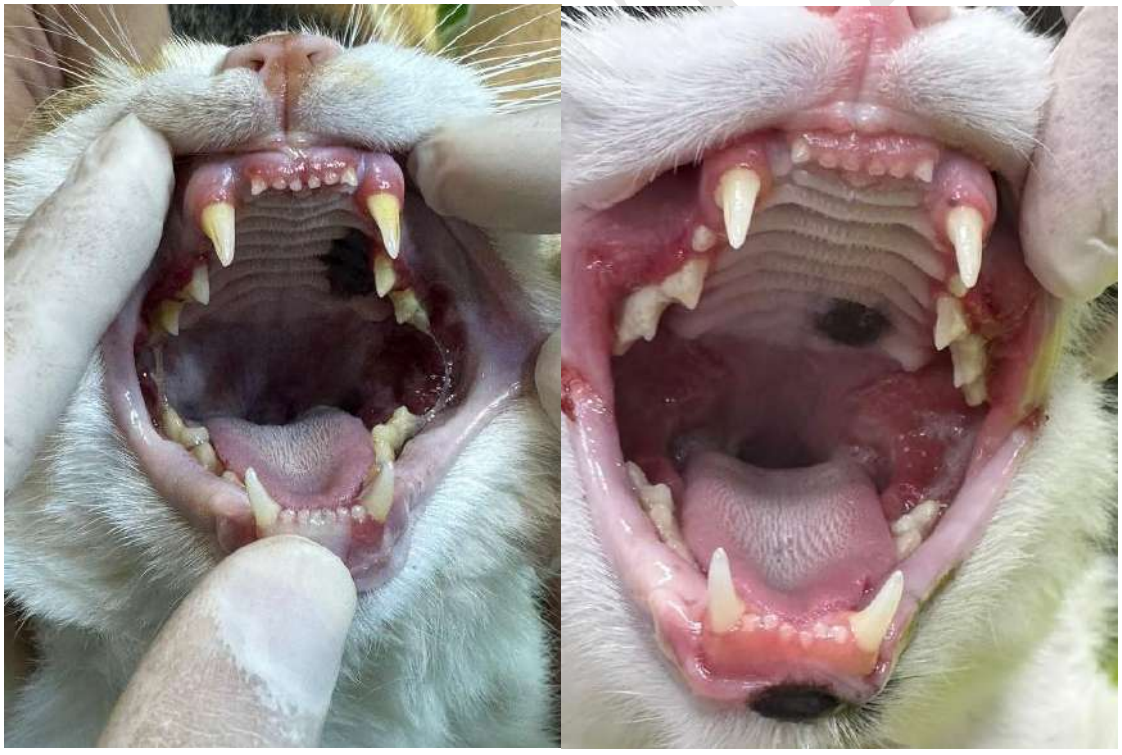

**Figure 1.** Cats diagnosed with feline chronic gingivostomatitis (FCGS), with generalized gingivitis (left, patient 2), with generalized gingivitis and bilateral proliferative lesions on the palatoglossal folds (right, patient 12).

Both patients underwent surgical treatment (4 and 7), and improvements in their clinical history were reported. In both cases, the owners noted a recovery of appetite for soft food, without gastrointestinal complications (e.g., vomiting, diarrhea), as well as an active mood.

## Discussion

FCGS is a severe and persistent chronic disease that affects the oral cavity of cats and is characterized by generalized inflammation of the gums, tongue, mucous membranes, and palatoglossal tissue, resulting in intense pain, anorexia, and decreased quality of life (Soltero-Rivera *et al.*, 2024). Studies on the presentation and evolution of this disease are limited because its etiology is unknown. This study describes 12 clinical cases of cats that were diagnosed with FCGS and referred for specialized veterinary dental consultation in the city of Medellín, Colombia. The reported cases provide insight into the diagnosis, treatment, and clinical evolution associated with this condition while also highlighting the importance of early diagnosis and appropriate intervention to improve the prognosis and well-being of patients. This is the first report of FCGS in Colombia in such detail. The reported cases were managed by a veterinary dental specialist.

The study cats ranged in age from 1.3-9 years. These findings are consistent with the literature, where FCGS can manifest across a wide age range, from young felines to older adults (Soltero-Rivera *et al.*, 2023). Although the number of cases included in this study is limited, preliminary results also indicate a higher prevalence in mixed-breed cats. Studies exploring the association between disease and breed have shown contradictory results (Fernández *et al.*, 2017). A slight predominance of females (7/12) was also observed among the diagnosed cats; however, the literature has not established a clear association between sex and susceptibility to develop this disease (Peralta and Carney, 2019). The variability in results among different studies may be influenced by factors such as sample size, definition of sex (intact, neutered), and the presence of other comorbid conditions. Therefore, larger-scale studies with more robust designs are needed to confirm this association and to determine whether specific genetic, environmental, or management factors predispose certain breeds to develop this disease.

No clear relationship is observed between diet and the onset of the disease, which is consistent with the limited evidence available in the literature (Lyon, 2005). One of the patients was fed a B.A.R.F. diet, six consumed commercial cat balanced feed, and in five cases, no information was obtained due to incomplete record-keeping. Although some studies have suggested a possible influence of diet on the development of oral diseases in cats, the evidence thus far is insufficient and inconclusive (Clarke and Cameron, 1998). Indeed, the diversity of dietary

patterns in this patient group does not allow the establishment of a direct relationship between diet and the onset or severity of FCGS. This finding underscores the need for further studies with larger samples and rigorous control of variables to determine whether there is a significant relationship between diet and this disease in cats.

Seven of the patients tested positive for *Bartonella* spp. via qPCR, representing 58.3% of the cases. However, the association between bacteria and disease remains contradictory according to the literature. While some studies suggest that it may play a role in the pathogenesis of the disease, others have reported no clear relationship (Dowers *et al.*, 2010). The high frequency of *Bartonella* spp. in this report could indicate the potential involvement of the pathogen in the development or exacerbation of FCGS, but the relevance of coinfections or other underlying immunological factors influencing the clinical picture cannot be ruled out. Our results emphasize the need for additional studies to investigate more deeply the role of this agent in the disease, adequately controlling for other etiological factors that may be involved.

The animals in this report were not subjected to diagnostic testing for FCV or FHV-1, despite both viral agents being strongly associated with the etiology of the disease. The scientific literature has demonstrated that FCV is present in a high percentage of cats with FCGS (Thomas *et al.*, 2017), whereas FHV-1 has been implicated in the exacerbation of clinical presentations (Lommer and Verstraete, 2003). The absence of specific testing in these patients represents a significant limitation of this report, as it prevents the evaluation of the potential relationship between the presence of these viruses and the severity or progression of the disease. This finding emphasizes the need to incorporate viral testing in future studies, which would allow for a better understanding of the role these viruses play in the pathogenesis of FCGS.

The diagnosis of FCGS presents considerable challenges because of the lack of a specific and definitive diagnostic test. The disease is recognized primarily by its clinical features, particularly the severe and extensive inflammation of the oral mucosa, which surpasses the gingival mucosa and extends to other areas of the oral cavity (Soltero-Rivera *et al.*, 2024). However, this assessment can be subjective and relies on the clinician's experience to differentiate it from other inflammatory dental diseases. Diagnosis is largely based on the exclusion of other conditions, such as neoplasms or infections, requiring a comprehensive approach that combines clinical observation with the systematic exclusion of other possible

causes. Biopsy may be useful for ruling out other pathologies, such as neoplastic lesions, but does not confirm the diagnosis (Kim *et al.*, 2023). This reliance on clinical observation and exclusion of other diseases makes the diagnosis of FCGS challenging, underscoring the need to improve diagnostic criteria and develop more precise tools for its identification in veterinary practice.

Only two patients (4 and 7), both of whom were negative for all the hemopathogens of interest, underwent surgical extraction, the treatment of choice for the disease. This rate reflects how the high costs of surgery may be related to the lack of treatment continuity (Jennings *et al.*, 2015). This report confirms that dental surgical extraction is an effective treatment for cats with FCGS, with a positive response and rapid improvement —at least during the first two postoperative weeks. Dental extraction as a treatment for this disease is a commonly employed therapeutic option in clinical practice because of its high effectiveness rate, which is estimated at 70-80%. However, this approach presents both pros and cons. Among the benefits, complete or partial tooth extraction can reduce the bacterial load associated with dental plaque and decrease inflammation, leading to notable improvement in most cases. Additionally, in patients who are refractory to other treatments —such as management with immunosuppressants or antibiotics, surgery has proven to be a relatively effective solution for improving their quality of life (Jennings *et al.*, 2015). However, 20 to 30% of patients do not respond favorably, leaving these cats with chronic and painful disease without a clear therapeutic option. Furthermore, dental extraction is an invasive procedure that requires general anesthesia, which poses risks, especially in cats with comorbidities. Another drawback is that this treatment lacks rigorous scientific support regarding its biological justification, as the theoretical basis linking the removal of teeth with the resolution of inflammation is not fully established. This raises questions about whether symptoms are being treated rather than the underlying cause of the disease. Despite these drawbacks, the lack of more effective alternatives means that dental extractions continue to be a key therapeutic option for managing FCGS in veterinary practice (Hennet 1997; Druet and Hennet, 2017). These observations warrant further follow-up during the postoperative recovery period of at least six months to establish the success rate of the procedure (Soltero-Rivera *et al.*, 2023).

FCGS remains a challenging condition in veterinary dentistry due to its complex and multifactorial nature. This study contributes valuable insights into the clinical presentation, diagnosis, and treatment of FCGS in a group of affected cats in Colombia. The findings

reinforce the importance of early diagnosis and prompt intervention to improve patient outcomes, as well as the need for more comprehensive diagnostic testing, particularly for viral pathogens such as FCV and FHV-1. Surgical dental extraction continues to be the most effective treatment available, with a high success rate in improving clinical signs; however, its accessibility remains limited due to cost and postoperative care requirements. The presence of *Bartonella* spp. in a high percentage of cases highlights the need for further investigation into potential regional etiologies and co-infections. Moving forward, larger-scale studies with extended follow-up periods are necessary to assess long-term treatment outcomes and refine management strategies. Practitioners should focus on a multidisciplinary approach that includes thorough diagnostic evaluations, patient-specific treatment plans, and long-term monitoring to enhance the prognosis and quality of life for affected cats.

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*Conflicts of interest*

The authors declare that they have no conflicts of interest regarding the work presented in this report.

*Author contributions*

MS and NMCV; conception, acquisition, analysis, and interpretation of the data; and drafting of the manuscript. All the authors made substantial contributions to and revised the manuscript and approved the final version.

*Use of artificial intelligence (AI)*

During the preparation of this work the authors used OpenAI ChatGPT (October 2023 version, https://chat.openai.com/) and Curie of American Journal Experts (September 2024 version, https://secure.aje.com/en/curie) in order to improve the readability and language of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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