

Management of Chronic Gingivostomatitis In Local Cats With A History of Recovery From Feline Calici Virus

Penanganan Gingivostomatitis Kronis pada Kucing Lokal dengan Riwayat Kesembuhan dari Feline Calici Virus

Mar'atul Halim Nafi'ah^{*1}, Putu Ayu Sisyawati Putriningsih², I Gusti Made Krisna Erawan²

¹Program Study of Veterinary Medicine, Faculty of Veterinary Medicine, Udayana University

²Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Denpasar-Indonesia

ABSTRACT

Background: Feline chronic gingivostomatitis (FCGS) is a chronic oral inflammatory condition that often affects cats. The cause of this condition is reported to be closely related to the immune system in its pathogenesis and infectious agents such as feline calici virus (FCV) along with bacterial infections. **Purpose:** To inform how to diagnose, and provides alternative treatment for patients with FCGS problem. **Case:** A cat presented for examination due to complaints of mouth scratching, such as food debris being stuck and the cat being very sensitive to touch at the mouth. The case cat was diagnosed with feline calici virus and eventually recovered. Before the case cat's recovery from FCV, the cat was very sensitive to touching its mouth. The case cat appeared generally healthy and active, but there was inflammation throughout the gums, also there was a foul odor. The palatoglossal area looked reddish, swollen, and there were ulcerative lesions. Supporting examinations performed were routine blood tests, oral swab cytology, and confirmation of Ag FCV and feline herpes virus (FHV-1) test kits due to suspicion of recurrence and other viral infections. Cytological swab examination showed neutrophils and blue coccus-shaped gram-positive bacteria, while the results of the Ag FCV and FHV test kits showed negative results. Based on all examination, the case animal was diagnosed with feline chronic gingivostomatitis (FCGS). **Case Management:** The therapy given included the administration of amoxicillin-clavulanate acid syrup antibiotics, methylprednisolone as anti-inflammatories, and multivitamin as supportive therapy. **Conclusion:** Evaluation of the treatment was carried out periodically and on day 21 the lesions found on the palatoglossal and the inflammation had disappeared.

ABSTRAK

Latar Belakang: Feline chronic gingivostomatitis (FCGS) adalah kondisi peradangan mulut kronis yang sering menyerang kucing. Penyebab kejadian ini dilaporkan sangat erat kaitannya dengan sistem kekebalan tubuh dalam patogenesisnya dan agen infeksius seperti feline calici virus (FCV) bersamaan dengan infeksi bakteri. **Tujuan:** Untuk menginformasikan cara mendiagnosis, dan memberikan pengobatan alternatif untuk pasien dengan masalah FCGS. **Kasus:** Seekor kucing diperiksa karena adanya keluhan suka menggaruk bagian mulutnya seperti ada sisa pakan yang tersangkut dan sangat sensitif saat disentuh pada bagian mulutnya. Kucing kasus pernah didiagnosis menderita FCV dan akhirnya sembuh. Sejak sembuh dari FCV, kucing sangat sensitif saat dipegang pada bagian mulut. Secara umum kucing kasus tampak sehat dan aktif, tetapi pada pemeriksaan fisik tampak adanya peradangan di seluruh gusi dan berontak saat akan diperiksa pada bagian mulut. Saat mulut terbuka tercium bau busuk dan pada bagian palatoglossal terlihat kemerahan, bengkak, serta adanya lesi ulseratif. Pemeriksaan penunjang yang dilakukan yaitu pemeriksaan darah rutin, sitologi swab oral, dan dikonfirmasi dengan tes kit Ag FCV serta feline herpes virus (FHV-1) karena kecurigaan adanya kekambuhan atau adanya infeksi virus lainnya. Pada pemeriksaan sitologi ditemukan neutrofil dan kumpulan bakteri gram positif berbentuk coccus. Hasil tes kit Ag FCV dan FHV menunjukkan hasil negatif. Berdasarkan anamnesis, pemeriksaan fisik, serta pemeriksaan laboratorium, hewan kasus di diagnosis mengalami FCGS. **Penatalaksanaan Kasus:** Terapi yang diberikan yaitu pemberian antibiotik sirup amoxicillin-clavulanate acid, antiradang methylprednisolone, dan multivitamin Livron B-plex sebagai terapi suportif. **Kesimpulan:** Evaluasi dari pengobatan dilakukan secara berkala dan pada hari ke-21 lesi yang ditemukan pada palatoglossal dan peradangan sudah hilang.

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*Correspondence:

Mar'atul Halim Nafi'ah

E-mail: maratul1412@gmail.com

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Kata kunci: Calici Virus; Feline Herpes Virus; Gingivostomatitis; Kucing

INTRODUCTION

Feline chronic gingivostomatitis (FCGS) is a disease of the oral mucosa with clinical signs of inflammation and ulcerative lesions that commonly affects domestic cats. Affected cats usually have extensive inflammatory lesions in almost the entire oral cavity, including the lateral areas of the palatoglossal folds. There are two clinical phenotypes of the disease: ulcerative and proliferative although some animals will exhibit both. Common lesions include moderate to severe oral pain, decreased or loss of appetite, worsened grooming habits, and decreased desire for activity (Druet and Hennet, 2017). According to the literature, cats diagnosed with FCGS may be euthanized due to lack of adequate therapy and worsening response after treatment (Soltero-Rivera, et al., 2023). The diagnosis of FCGS is based on the findings of clinical signs and histopathologic examination. The incidence of these cases is closely related to the immune system. Clinical studies also suggest the involvement of several viral agents in the etiopathogenesis of FCGS, including feline calici virus (Silva, et al., 2021). This disease is immune-mediated and the immune response is strongly associated with feline calici virus (FCV) infection, besides that FCGS is also closely related to genetic and metabolic pathways (Wardhani, et al., 2023).

Feline chronic gingivostomatitis (FCGS) is commonly treated in two ways, surgery and drug therapy. The mainstay of local surgical treatment is in the form of surgical extraction of some or almost all teeth (Soltero-Rivera, et al., 2023). Whole tooth extraction has a high risk and impact of post-surgical trauma in some reported cases, so partial tooth extraction as the first stage of treatment is recommended. If there is no positive response within 1 to 4 months after partial tooth extraction, whole tooth extraction can be performed as the second stage of treatment (Druet and Hennet, 2017). Most cats with FCGS require additional medical management in addition to surgical treatment, medical management in the form of immunosuppressive or immunomodulatory therapy is an option because FCGS is an immune-mediated inflammatory disease (Lee, et al., 2020). In situations where there are constraints cost for complete dental extractions, or concerns regarding post-surgical trauma exist, medical management of feline chronic gingivostomatitis (FCGS) presents a practical alternative (Soltero-Rivera, et al., 2023). This approach prioritizes controlling the inflammatory response and mitigating clinical signs through immunosuppressive therapies like corticosteroids or cyclosporine, thereby offering a more cost-effective solution. Furthermore, antimicrobial therapy addresses secondary bacterial infections identified through cytology or culture, complementing the immunosuppressive therapies (Lee, et al., 2020). Therefore, this case report aims to give information on how to diagnose, and provides alternative treatment for patients with FCGS problems by medical management.

CASE

Anamnesis and Physical Examination

The case cat was named Kimmy, male, neutered, domestic breed, 5 years old, weighed 3.5 kg, and had a broken mackerel

tabby coat. The case cat was brought to the Veterinary Internal Medicine Laboratory, Faculty of Veterinary Medicine, Udayana University with complaints from the owner that the cat liked to scratch the mouth as if something was stuck after eating and the cat was very sensitive when touched on the mouth. In 2022, the cat was diagnosed with FCV infection. After the treatment period was completed, the cat never wanted to be held by the mouth and had experienced paralysis after vaccination. Until recently, the cat was walking abnormally with an imbalance in the hind legs when walking. The case cat still had a good appetite and was active. However, the cat was very sensitive and rebelled when the owner tried to open its mouth. The cat's weight had decreased since vaccination and feed is always left in the feed bowl.

The preexisting status of the case cat was as follows: 24 breaths/minute, 128 heartbeats and pulses/minute, and rectal temperature of 38.8°C. The case cat always avoided being touched in the mouth and struggled when the mouth area was examined. When the case cat's mouth was opened there was a foul odor and redness and swelling of the gums and palatoglossal ulcerative lesions were seen (Figure 1). In addition, the hind legs of the case cat appeared unbalanced when supporting the body to walk.

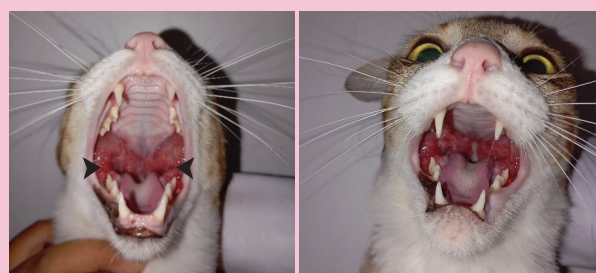


Figure 1. The palatoglossal mucosa is red and swollen, also there are ulcerative lesions (black arrows).

Laboratory Examination

To determine the physiological condition of the case cat, a complete blood test was performed which showed that the case cat had leukocytosis, lymphocytosis and monocytosis. The results of the complete blood examination are presented in Table 1. Another laboratory examination performed was oral swab cytology using samples taken from ulcerative lesions in the palatoglossal area. The cytologic swab examination revealed an accumulation of neutrophils and spirose-ta-shaped bacteria (Figure 2). As there is an association between the incidence of FCGS caused by viral infectious agents and the possibility of recurrence, FCV Ag kit test and feline herpes virus (FHV) Ag kit test were performed. The kit tests were negative for the two suspected viruses infecting the case cat.

Diagnosis and Prognosis

Following anamnesis, physical examination, and supporting laboratory findings, the cat was diagnosed with feline chronic gingivostomatitis (FCGS), and the prognosis was determined to be favorable (fausta).

Table 2. Results of Complete Blood Count

Parameter	Reference*)	Result	Category
WBC ($\times 10^3/\mu\text{l}$)	5.5-19.5	21.91	Increased
Limfosit# ($\times 10^3/\mu\text{l}$)	0.8-7	12.84	Increased
Monosit# ($\times 10^3/\mu\text{l}$)	0-1.9	2.21	Increased
Granulosit# ($\times 10^3/\mu\text{l}$)	2.1-15	6.86	Normal
Limfosit%	12-45	58.6	Increased
Monosit%	2-9	10.1	Increased
Granulosit%	35-85	31.3	Decreased
RBC ($\times 10^6/\mu\text{l}$)	4.6-10	6.85	Normal
HGB (g/dL)	9.3-15.3	10.1	Normal
MCHC (g/dl)	30-38	28.7	Decreased
MCH (pg)	13-21	14.8	Normal
MCV (fL)	39-52	51.6	Normal
RDWCV (%)	14-18	13.3	Decreased
RDWSD (fL)	35-56	32	Decreased
HCT (%)	28-49	35.3	Normal
PLT ($\times 10^3/\mu\text{l}$)	100-514	216	Normal
MPV (fL)	5-11.8	8.2	Normal
PDW (fL)	10-18	8.6	Decreased
PCT (%)	0.1-0.5	0.176	Normal
P-LCR (%)	13-43	20.3	Normal

Note: WBC = white blood cell; RBC = red blood cell; HGB = Hemoglobin; MCHC = mean corpuscular hemoglobin concentration; MCH = mean corpuscular hemoglobin; MCV = mean corpuscular volume; RDWCV = red cell distribution width coefficient variation; RDWSD = red cell distribution width standard deviation; HCT = hematocrit; PLT = Platelet; MPV = mean platelet volume; PDW = platelet distribution width; PCT = procalcitonin; P-LCR = platelet large cell ratio. *) RT-700 Auto Veterinary Hematology Analyzer.

Treatment

Treatment was carried out by giving antibiotics amoxicillin-potassium clavulanate syrup at a dose of 10 mg/kg BW twice a day for 14 days, anti-inflammatory metylprednisolone at a dose of 2 mg/2-6 kg BW once a day for 14 days. To maintain the integrity of the physiological condition and accelerate the improvement of recovery, supportive therapy was given Livron B-plex 1 tablet / day. From the treatment given, evaluation was carried out gradually to determine the progress of the case cat. On the 21st day of treatment the lesions found on the palatoglossal and the inflammation had disappeared. On day 30th the lesions did not appear again so the treatment was stopped.

RESULT

Based on the examination performed, along with the clinical condition of the case cat which was still active and had a good appetite, it was decided to give oral treatment. All treatments given resulted in good progress in the animal. On the 21st day after treatment, the cat showed improvement with no palatoglossal lesions and no swelling or redness of the gums. On day 30th, the lesions did not appear again so the treatment was stopped. This treatment may be an alternative option before doing an extraction to all of the cat's teeth, which may cause the cat to experience feeding difficulty eating or even stress, also it can minimize the medication cost.

DISCUSSION

The occurrence of feline gingivostomatitis is closely correlated with the feline immune response, moreover its development can be attributed to range of infectious and noninfectious agents. Studies conducted on several cats with FCGS

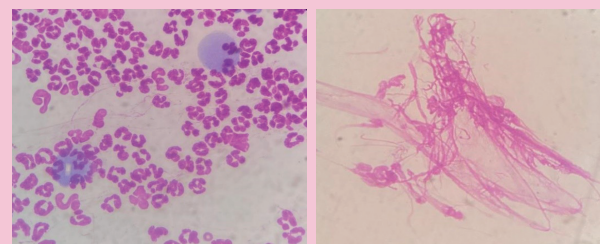


Figure 2. A. Accumulation of neutrophils. B. Spiroseta-shaped bacteria.

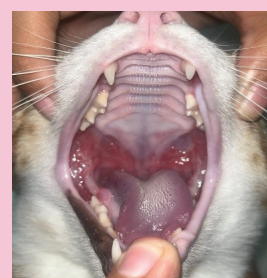


Figure 2. Palatoglossal swelling and redness had disappeared by day 21 of treatment

have found associated infectious agents including FCV, feline herpes virus (FHV-1), and feline immunodeficiency virus (FIV) along with various bacteria. Rolim, et al., (2017) stated that FCGS was most prevalent in male cats, although there was no predilection for either sex. This finding may occur given the behavior and habits of male cats, which are more aggressive than female cats, increasing the likelihood of direct contact with agents such as FCV, FIV, and FeLV.

Common clinical symptoms of FCGS are halitosis, sialorrhea, difficulty eating dry feed, and decreased body condition (Soltero-Rivera, et al., 2023). In this case, halitosis was found, but sialorrhea was not apparent. The case cat had a good appetite, but had a habit of scratching the mouth as if there was food residue stuck between the teeth. According to the owner, the case cat had also lost weight since recovering from FCV as seen from the case animal's body condition which appeared hungry and fat hanging on the abdomen. Physical examination revealed severe inflammation of the gingiva, affecting nearly all dental margins, and ulcerative lesions extending from the palatoglossal folds to the base of the tongue. These pathological findings are similar to the severe ulcerative form of FCGS. Rolim, et al., (2017) reported that in 80.8% (21/26) of the cases studied there were reddened lesions that were scattered, proliferating, fragile and tended to bleed on palpation. Furthermore, 23.1% (6/26) presented lesions were multifocal or even fused, forming multiple vesicles in the palatoglossal folds that were reddish and edematous, mirroring the current case's clinical presentation.

Oral mucosa has an important role as mechanical defense, and its examination with diagnostic procedures, such as cytology and histopathology is essential for identifying pathological changes that can significantly impact cat health. In this case a cytological examination of oral swabs was performed

revealed a significant accumulation of neutrophils and spiroseta bacteria. According to [Lee, *et al.*, \(2020\)](#), chronic gingivostomatitis disease is indicated by the presence of lymphocytes and plasma cells predominantly in the affected oral tissue, with some findings of neutrophils, mott cells, and mast cells. In addition, a report presented by [Yamaki, *et al.*, \(2023\)](#) on a cat diagnosed with gingivostomatitis found the presence of spirochetes bacteria in smear samples and was strongly associated with gingivitis in cats. The oral mucosa provides first-line mechanical protection against environmental perturbations, including disease-causing microbes, chemicals, physical damage during chewing, and airborne allergens. Successful maintenance of the balance of functions is necessary to maintain the health of the mouth and digestive system. The oral mucosa consists of the surface epithelium and the inner supporting loose connective tissue called lamina propria. Beneath the oral mucosa is deeper connective tissue that supports the mucosa called submucosa and can contain glands, muscles, blood vessels, and nerves ([Nanci, 2017](#); [Murphy, *et al.*, 2019](#)). The mucosal immune system consists of interactions between cells in the epithelial layer, lamina propria, and lymphoid tissue. An intact epithelium is the first line of defense in the oral cavity. Antigen presenting cells capture antigens from the epithelium and then migrate to lymphoid follicles, where they activate T cells through antigen presentation. After antigen recognition, these activated T cells differentiate into effector cells. T lymphocytes in the mucosa play an important role in mucosal immunity and tolerance ([Şenel, 2021](#)). In FCGS, however, the delicate balance of protection in oral mucosa may be disrupted. The observed neutrophilic infiltrate in this case suggests an acute inflammatory response, potentially triggered by the spirochete bacteria found in cytological examination. This acute response may make worse the chronic lymphocytic-plasmacytic inflammation typically associated with FCGS. The presence of spirochetes, while not a consistent finding in all FCGS cases, implies a potential role in compromising the oral mucosal barrier, facilitating deeper tissue invasion, and contributing to the observed severe inflammation. Further investigation is warranted to clarify the precise role of spirochetes in the pathogenesis of FCGS and their interaction with the feline oral mucosal immune system.

Extraction of all teeth or premolars and molars is the currently accepted standard of FCGS treatment ([Jennings, *et al.*, 2015](#)). Substantial improvement or complete remission has been reported in 67-80% of FCGS cats ([Bellei, *et al.*, 2008](#)). However, 69% of cats that show improvement still require extended medical treatment ([Jennings, *et al.*, 2015](#)). The therapy chosen was use of antibiotics amoxicillin and clavulanate acid which, according to [Da Silva, *et al.*, \(2018\)](#), has a good therapeutic effect on FCGS cases. In addition, anti-inflammatory methylprednisolone was given, which is a glucocorticoid class drug used to treat various inflammatory conditions in pets with adrenal gland diseases, and pets with immune-mediated diseases. They are similar to prednisone/prednisolone but slightly stronger. In addition to the administration of non-steroidal anti-inflammatory drugs

(NSAIDs) or corticosteroids, feeding a diet containing omega 3 and omega 6, can be an additional alternative to address the inflammation that occurs ([Corbee, *et al.*, 2012](#)). The case cat was also given supportive therapy in the form of Livron-Bplex multivitamins to help improve the physiological condition of the animal which if ignored, it was feared that the animal would experience anemia. Livron B-plex contains vitamin B12, folic acid, and ferrous gluconate which are necessary for the maturation of erythrocytes or erythropoiesis. [Koury and Ponka \(2004\)](#), stated that folic acid, vitamin B12, and iron are very important in the process of erythropoiesis. In addition, Livron B-plex also contains vitamin C which helps accelerate the healing of lesions. According to research conducted by ([Tada and Miura, 2019](#)), vitamin C has been shown to improve conditions and reduce inflammatory reactions in periodontal disease. Periodontal healing activity is attributed to the antioxidant activity of vitamin C, and its role in collagen biosynthesis which facilitates wound healing ([Dodington, *et al.*, 2015](#)).

CONCLUSION

Based on anamnesis, clinical examination, and laboratory supporting examination, the case animal was diagnosed with FCGS with a prognosis of fausta. Therapy with antibiotics amoxicillin-clavulanic acid, anti-inflammatory methylprednisolone, and multivitamin Livron B-plex gave good results, characterized by the disappearance of palatoglossal lesions and swelling and redness of the gums.

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CONFLICT of INTEREST

The author declares no conflict of interest in the authorship of this case report.

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ETHICAL APPROVAL

In this Case Study, there is no ethical approval needed.

AUTHORS' CONTRIBUTIONS

MHN handles cases, records data, processes data, and writes articles. PASP is responsible as a supervisor in handling cases, selecting therapy, and post-therapy evaluation as well as criticizing article writing. IGMKE provides criticism on data processing and article writing.

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