

VETERINARY DERMATOLOGY



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Eosinophilic Granuloma of the Tongue in a Cat

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Abstract

Introduction. Recently, there has been a large number of oral diseases in cats. Eosinophilic granuloma (EG) of the oral cavity may be a single lesion or occur simultaneously with other forms of the eosinophilic granuloma complex (CEG). The purpose of this article is to describe a clinical case of eosinophilic granuloma of the tongue in a cat and the possibility of effective treatment with prednisone.

Description of a clinical case. The article presents a clinical case of EG of the tongue in a cat, which also showed symptoms of itching, cutaneous erythema, as well as skin EG a few days after the formation of a tongue granuloma. The diagnosis of EG of the tongue was based on the data of anamnesis, clinical examination, cytological examination. Cytological examination revealed eosinophilic inflammation of the nodular formation on the tongue. During prednisone therapy at a dose of 2 mg / kg after a week, a significant decrease in the volume of the EG tongue was noted, then the dose was gradually reduced. The full course of prednisone therapy was 5 weeks until the symptoms completely disappeared.

Discussion. According to literature data, allergic factors (flea dermatitis, food allergy and non-food hypersensitivity) can be the causes of EG of the tongue. The symptoms may occur simultaneously with or without skin symptoms. In our case, the manifestation of itching, erythema of the skin appeared a few days after the formation of an eosinophilic plaque on the tongue. Prednisone can be used as therapy for oral hypertension, with starting doses ranging from 2 to 4 mg/kg per day. In our case, the starting dose of prednisone 2 mg / kg day, followed by a gradual dose reduction, had a pronounced therapeutic effect.

Conclusion. The treatment results and photographic materials provided in the article, demonstrating the manifestations of EH in the oral cavity, are useful for practicing specialists: a general veterinarian, dentist, oncologist, dermatologist, including in the differentiation of tumor and non-tumor lesions of the tongue. The importance of using cytological examination for the diagnosis of EH is shown. The use of prednisone has shown efficacy in the treatment of EG tongue.

Keywords: clinical case, eosinophilic granuloma, oral cavity

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Эозинофильная гранулема языка у кошки

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Аннотация

Введение. В последние годы у кошек регистрируется значительное число заболеваний полости рта. Эозинофильная гранулема (ЭГ) данной локализации может быть единственным патологическим проявлением либо сочетаться с другими формами комплекса эозинофильной гранулемы (КЭГ). Цель настоящей статьи — описание клинического случая эозинофильной гранулемы языка у кошки, а также оценка возможности эффективного лечения с применением преднизолона.

Описание клинического случая. В статье представлен клинический случай ЭГ языка у кошки, у которой также наблюдались зуд, кожная эритема, а через несколько дней после формирования гранулемы языка — кожная форма ЭГ. Диагностика поражения языка была основана на данных анамнеза, клинического осмотра и цитологического исследования. При цитологическом исследовании узлового образования на языке выявлен эозинофильный характер воспаления. На фоне терапии преднизолоном в дозе 2 мг/кг через неделю отмечалось

значительное уменьшение объема ЭГ языка; в дальнейшем дозу препарата поэтапно снижали. Полный курс лечения преднизолоном составил 5 недель и завершился полным исчезновением клинических симптомов.

Обсуждение. Согласно литературным данным, причинами ЭГ языка могут быть аллергические факторы: блошиный дерматит, пищевая аллергия и непищевая гиперчувствительность. Клинические проявления способны развиваться как одновременно с кожными симптомами, так и без них. В представленном случае зуд и эритема кожи возникли через несколько дней после формирования эозинофильной бляшки на языке. Преднизолон может применяться для терапии ЭГ ротовой полости; его стартовые дозы составляют от 2 до 4 мг/кг в сутки. В нашем наблюдении начальная доза преднизолона 2 мг/кг в сутки с последующим поэтапным снижением обеспечила выраженный терапевтический эффект.

Заключение. Представленные в статье результаты лечения и фотоматериалы, демонстрирующие проявления ЭГ в ротовой полости, могут быть полезны для практикующих специалистов: ветеринарного врача общей практики, стоматолога, онколога и дерматолога, в том числе при дифференциации опухолевых и неопухолевых поражений языка. Показана значимость цитологического исследования для диагностики ЭГ. Применение преднизолона продемонстрировало эффективность при терапии ЭГ языка.

Ключевые слова: клинический случай, эозинофильная гранулема, полость рта

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Introduction. Eosinophilic granuloma complex (EGC) is a common feline disease that is localized on the skin, skin and mucous membrane, as well as in the oral cavity [1]. Classically, EGC in cats is manifested by three types of lesions: indolent ulcer, eosinophilic plaque and eosinophilic granuloma [2]. Eosinophilic granulomas (EG) in cats can form in the oral cavity, including causing tongue lesions [3].

Eosinophilic plaques, EG, and indolent ulcer are characterized by the presence of an eosinophilic infiltrate in the tissues [4]. Eosinophils play a complex role in the allergic reaction and they are one of the factors of tissue damage in allergic inflammation due to the release of cytotoxic granular proteins. In addition, they secrete a wide range of pro-inflammatory substances, including granular proteins, lipid mediators, cytokines, and chemokines [5].

It is important to note that EGC is not an independent dermatological diagnosis; many etiological factors are considered as potential causes of its development [2]. It is believed that these formations represent a group of skin reactions to primary pathological processes, most often associated with hypersensitivity to an unknown antigen [6]. The causes of EG most often include hypersensitivity to airborne and food allergens, flea saliva, and insects [7]. In addition, idiopathic cases of eosinophilic granulomas occur. There are suggestions about a genetic predisposition to this pathology [2].

In addition to flea saliva, food proteins and environmental allergens, autoallergens of cats can be the cause of lesions in EGC. In atopic dermatitis in humans, autoallergens are intracellular proteins released from cells during inflammation and self-injury. In cats, by contrast, autoallergen is a protein found in saliva. It is possible that it penetrates into deeper layers of the skin after excessive licking of the affected areas and acts similarly to intracellular autoallergens in human diseases [2].

There is also an opinion that some EG of oral cavity may be associated with a traumatic lesion due to damage to the mucous membrane and insect fragments getting stuck during cat hunting [2]. In humans, traumatic ulcerative granuloma with stromal eosinophilia occurs on the tongue, histological examination of which reveals a large number of eosinophils in the stroma. This lesion of the tongue may be associated with chronic trauma, leading to an imbalance of tissue antigens or the ingestion of toxins, microorganisms, endogenous degradation products or foreign proteins into the tissues, which can provoke a local immune reaction. There may also be a relationship between mast cells, the release of eosinophilic chemotactic factor, and tissue eosinophilia. However, none of the studies have been able to establish a clear link between trauma and the development of such injuries [8]. A reliable allergic cause of eosinophilic granuloma is rarely detected. Indolent ulcer, which occurs against the background of other skin diseases, may be associated with allergic factors. However, in the presence of an indolent ulcer in the form of a single lesion, it is more difficult to determine the root cause [9].

It should also be taken into consideration that up to 3% of all tumors in cats are localized in the oral cavity. At the same time, malignant processes are more common than benign ones [10].

According to the study by J. Riker [6], non — cancerous tongue lesions were diagnosed in 57% of cases in dogs and 59% in cats among all nodular formations of this localization. Eosinophilic granuloma was detected in 60% of non-tumor lesions in cats during the 10-year follow-up period [11].

Eosinophilic granuloma can resemble a number of other diseases, including viral, bacterial, and fungal infections, as well as neoplastic processes [7]. The similarity of the clinical manifestations of neoplasms and EG in the oral cavity, including on the tongue, often leads to the fact that owners primarily seek an appointment with an oncologist. In the

presented case, an 11-year-old cat with hemorrhagic impurities in saliva and bad breath was admitted to the reception. Upon examination, a tumor-like formation of unknown origin was detected, localized in the lateral part of the tongue on the left.

The aim of the study was to describe a clinical case of eosinophilic granuloma of the tongue in a cat, as well as to determine the required dose and duration of prednisone treatment until the symptoms disappear. The results obtained will help veterinarians pay attention to the data of the primary diagnosis, careful collection of medical history and concomitant clinical signs when making a diagnosis.

Description of a clinical case. The clinic was contacted by the owners of an 11-year-old British neutered cat. The animal was kept in an apartment; the diet included turkey-flavored Grandorf dry food. Vaccinations were carried out annually with Biofel PCR (Bioveta, Czech Republic). The results of PCR on FeLV and FIV were negative (the study was performed in the VetUnion laboratory). According to the medical history, over the past 4-5 years, the cat has been prescribed short courses of prednisone for 3-7 days several times a year due to itching in the head and thoracic extremities. Hydrolyzed protein diets and monoprotein fish feeds were used as elimination diets. No provocation was performed after the feed change. Ectoparasite treatments were performed irregularly.

During the week before the treatment, the owners noticed hemorrhagic impurities in the cat's saliva and bad breath. At the same time, appetite and activity remained at the usual level. The owners also found neoplasm in the language. There was no itching during this period.

During the examination, it was found that a plaque with an ulcer measuring 1.5×0.7 cm was found on the lateral surface of the tongue on the left (Fig. 1). The visible mucous membranes were pink and moist. The skin and coat are without visible damage. The superficial lymph nodes are not enlarged.

On the second day after taking the material for cytological examination, itching in the area of the left thoracic limb, erythema, excoriation and swelling of the left auricle, as well as signs of eosinophilic plaque in the right axillary area were developed (Fig. 2).



Fig. 1. Eosinophilic granuloma of the tongue before therapy



Fig. 2. Skin symptoms related to EG

Table 1

The results of a general blood test

Indicator	Standard range	Result
White blood cells ($10^9/l$)	5,5 – 19,5	4,6
Lymphocytes ($10^9/l$)	0,8 – 7,0	0,9
Monocytes ($10^9/l$)	0,0 – 1,9	0,2
Granulocytes ($10^9/l$)	2,1 – 15,0	3,5
Lymphocytes, %	12,0 – 45,0	19,8
Monocytes, %	2,0 – 9,0	4,1
Granulocytes, %	35,0 – 85,0	71,6
Eosinophils, %	2 – 8	4,5
Red blood cells ($10^{12}/l$)	4,60 – 10,00	7,5
Hemoglobin, g/l	93 – 153	98
Hematocrit, %	28,0 – 49,0	31
Thrombocrit, %	0,15 – 0,50	0,008
Average red blood cell volume, fL	39,0 – 52,0	41,5
Average hemoglobin content in a red blood cell, pg	13,0 – 21,0	12,9
Average concentration of hemoglobin in the erythrocyte, g/l	300 – 380	312
Indicator of erythrocyte anisocytosis, %	14,0 – 18,0	16,3
Thrombocyte ($10^9/l$)	100 – 514	27
Average thrombocyte volume, fL	5,0 – 11,8	6,9
White blood cells ($10^9/l$)	–	16,1

Diagnostics. Laboratory procedures included general and biochemical blood tests. A biochemical blood test was performed on a Seamaty SMT-120 Vp analyzer, and a general blood test was performed on a Mindray BC—2800Vet analyzer.

Table 2

The results of a biochemical blood test

Indicator	Standard range	Result
Albumin, g/l	34,6	22 – 44
Total protein, g/l	73,7	57 – 90
Globulins, g/l	39,1	23 – 52
Albumin/globulin ratio	0,88	0,6 – 1,4
Alanine Aminotransferase, U/L	57	5 – 130
Alkaline phosphatase, U/L	42	14 – 111
Creatinine, $\mu\text{mol/l}$	74,9	45 – 278
Blood Urea Nitrogen, $\mu\text{mol/l}$	9,31	4 – 12,9

No deviations from the reference values were detected in the biochemical blood analysis (Table 2), however, thrombocytopenia of $27 \times 10^9/\text{L}$ was found in general blood analysis (Table 1), confirmed by the Fonio method.

For the study on *Feline calicivirus*, flushes from the mucous membrane of the oropharynx and tongue were used by PCR diagnostics, the study was performed in the VetUnion laboratory. According to the results of the PCR study, Feline calicivirus RNA was not detected in the test sample.

Since thrombocytopenia is accompanied by a potential risk of bleeding, it was decided not to perform a biopsy followed by histological examination before performing a coagulogram and to limit the cytological analysis of the formation. This method is used for the primary diagnosis of both eosinophilic granulomas and tumor lesions [3].

The sampling of the material for cytological examination was carried out by fine needle aspiration biopsy (FNA). According to the results of cytological examination of the tongue neoplasm, eosinophilic inflammation was revealed (Fig. 3).

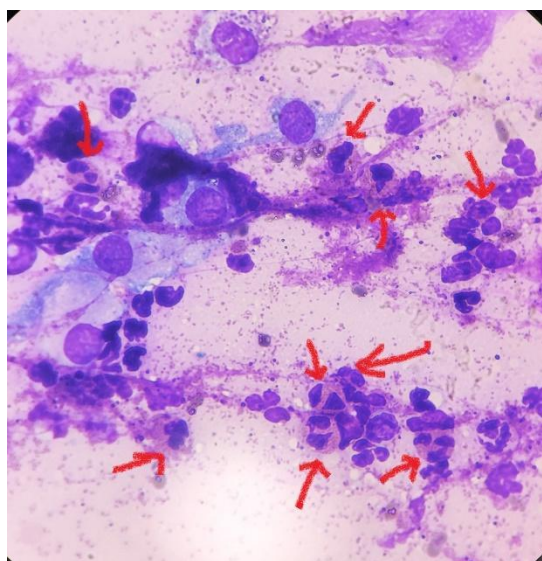


Fig. 3. Eosinophils (marked with arrow), neutrophils, reactive fibroblasts, macrophages in cytological preparation

Differential diagnosis

1. During the initial examination, the differential diagnosis primarily included a calicivirus infection. The clinical manifestations of infection caused by calicivirus can be different, including symptoms of upper respiratory tract infection, ulcers on the tongue, and gingivostomatitis [11]. The negative result of the PCR study, normothermia, preserved appetite, the presence of plaque lesions rather than tongue ulcers, as well as the absence of respiratory symptoms made it possible to exclude calicivirus from the list of differential diagnoses.

2. Contact stomatitis can develop as a hyperimmune reaction to plaque and oral bacteria, as well as in response to traumatic damage to the mucous membrane [1]. Cytological examination in the case of contact stomatitis does not reveal tumor growth, while there are signs of neutrophilic or mixed inflammation [6]. On examination, there were no signs of periodontitis or traumatic damage to the teeth in the areas of contact with the mucous membrane and gums. The data of

the clinical examination and cytological examination made it possible to exclude contact stomatitis from the list of differential diagnoses.

3. Tumor lesion of the tongue. According to a study by P. Brilhante-Simões et al. [3], the cytological method can be used to differentiate between tumor and non-tumor lesions, since it has a high specificity. In the presented case, according to the results of cytological examination, a conclusion was obtained about the non — cancerous nature of the lesion - eosinophilic inflammation.

Treatment. Based on the results of cytological examination and pronounced clinical manifestations of itching, it was decided to prescribe a course of prednisone at a starting dose of 2 mg/kg per day with a gradual decrease in dosage after 7 days. By week 2, the prednisone dose was reduced to 1 mg/kg once every 24 hours; by week 3, to 0.5 mg/kg once every 24 hours; by week 4 — to 0.5 mg/kg once every 48 hours; by week 5, to 0.25 mg/kg once every 48 hours. After completing the course, the drug was canceled.



Fig. 4. EG one week after treatment

Within two days, the itching stopped, and the plaque on the tongue began to decrease. A week after the start of prednisone therapy, the volume of neoplasm decreased significantly; ulcerative lesions remained on the lateral surface of the tongue (Fig. 4), which gradually epithelized during treatment. The skin manifestations — erythema and plaque in the axillary region — regressed within a week.

Simultaneously with the prednisone course, the patient was prescribed ectoparasite treatment with a drug in the form of spot-on drops containing imidacloprid and moxidectin (Advocate; Elanco), as well as an elimination diet for 12 weeks (Royal Canin Hypoallergenic) followed by provocation. After completing the diet, food hypersensitivity was not confirmed. There were no clinical signs of recurrence during the 12 weeks of follow-up.

Discussion. According to literature data, EG can affect any part of the oral cavity, including the tongue [1]. Taking into account the fact that with nodular lesions in the oral cavity, it is necessary to exclude tumor diseases, including malignant ones [4], careful medical history collection and comprehensive diagnosis are of particular importance.

In this case, the cat had a history of allergies, including itching in the scalp and erythema of the skin. On the 8th day after the detection of a nodular lesion of the tongue, that is, on the second day after the visit to the clinic, skin symptoms appeared: itching, excoriation, erythema of the skin and eosinophilic plaque. These signs made it possible, first of all, to include eosinophilic granuloma of the tongue in the list of differential diagnoses. Since the biopsy was postponed due to thrombocytopenia, the appearance of skin symptoms and the presence of eosinophilic infiltrate according to the results of cytological examination of tongue formation served as the basis for the initiation of prednisone therapy.

The recommended starting doses of prednisone for therapy range from 2 to 4.4 mg/kg [2]. In addition, prednisone is recommended to be used at a dose of 1 mg/kg once or twice a day in atopic skin syndrome of cats [12]. Due to suppression of the adrenal cortex induced by exogenous glucocorticoids during a course lasting more than 14 days, abrupt withdrawal of the drug creates a risk of acute adrenal insufficiency, which necessitates a gradual reduction in dosage [14].

In the presented case, the cat received prednisone at a dose of 2 mg / kg orally for 7 days from the first day, 1 mg / kg for the next 14 days, with a further decrease in dosage and complete withdrawal of the drug after 5 weeks. Significant

clinical improvement and reduction of granuloma during therapy were noted during the first 7 days, the total course of treatment was 5 weeks. As a result of the therapy, the granuloma of the tongue was completely resolved.

Common causes of EG in cats are flea dermatitis, food allergies, and non-food hypersensitivity [7]. Regular ectoparasite treatments can eliminate possible flea allergies, and diet therapy can eliminate suspected food allergies [12].

According to the results of the elimination diet, the relation of EG with the food allergen was not revealed in this patient. Flea treatments were carried out for 12 weeks. Evaluation of their effectiveness requires further monitoring, since, according to literature sources, such treatments are prescribed for a period of 8 weeks or more [13].

This clinical case demonstrates the need to compare anamnestic data in the detection of tumor-like tongue neoplasms in cats. It is necessary to take into account the presence of manifestations of allergic reactions and eosinophilic granulomas of the skin that preceded the treatment or were noted during the visit to the clinic. This makes it possible to include eosinophilic granuloma of the tongue in the list of differential diagnoses. Conducting primary cytological diagnostics makes it possible to differentiate between a tumor lesion and a non-tumor process.

Conclusion

- primary cytological diagnostics should be performed in cats with nodular lesions in the oral cavity. This method can be quite informative and useful in the practice of a veterinarian for the formation of a preliminary diagnosis, as well as for the differentiation of tumor and non-tumor lesions of the oral cavity. If eosinophilic inflammation is detected, it is possible to diagnose eosinophilic granuloma;

- in this clinical case, prednisone at a dose of 2 mg/kg, followed by a decrease in dosage, showed efficacy in the treatment of EG tongue from the first day of use. There were no side effects for the cat. The duration of therapy was 5 weeks, and the first improvements were noticeable during the first week;

- since the eosinophilic granuloma complex can be part of the atopic skin syndrome of cats and develop as a result of allergies to environmental allergens, food allergies, or hypersensitivity to flea bites, the diagnostic approach to eosinophilic granuloma of the tongue, which occurs with concomitant skin symptoms, included an elimination diet and flea treatments;

- when diagnosing nodular lesions of the tongue in cats, the medical history, clinical manifestations and results of cytological examination should be taken into account. The treatment results presented in the article and photographic materials demonstrating the manifestations of EG in the oral cavity can be useful for practicing specialists: a general veterinarian, dentist, oncologist and dermatologist, including in the differentiation of tumor and non-tumor lesions of the tongue.

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