



A Case of Bilateral Conjunctivitis in a Seven-Year-Old Shih-Tzu Dog

Kasus Konjungtivitis Bilateral Pada Anjing Shih-Tzu Berusia Tujuh Tahun

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ABSTRACT

Background: Conjunctivitis is an inflammation of the conjunctiva that is common in dog, which also known as pink eyes. Conjunctivitis can be caused by infectious agents such as bacteria, chlamydia, and virus, and can also be induced by allergies or due to trauma. Bilateral infection may indicate they are caused by an infectious agent or allergy. **Purpose:** This study aims to provide veterinarians with insight into the treatment of conjunctivitis cases and the factors that hinder therapy. **Case:** A seven-year-old female Shih-Tzu dog has had eye problems for six months since April 2023. Physical examination revealed redness in the left and right eyes with mucopurulent exudate. Laboratory examination using an impression smear followed by cytology confirmed inflammation in the eye with many neutrophil cells and coccus-shaped bacteria. The dog was diagnosed with bacterial conjunctivitis with a good prognosis. **Case Management:** The therapy consisted of the administration of topical antibiotics in the form of Erlamycetin plus® (chloramphenicol and dexamethasone) eye drops for five days, followed by Erlamycetin® (chloramphenicol) eye ointment. **Conclusion:** After 12 days of therapy, there was no redness in the dog's eyes and only a small amount of exudate was observed. However, on day 14, the owner reported that exudates were observed in the dog's eyes. The therapy resulted in improvements but was not optimal because the owner did not consistently follow the recommendations.

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ABSTRAK

Latar Belakang: Konjungtivitis atau disebut juga *pink eye* merupakan peradangan pada konjungtiva yang umum terjadi pada anjing. Konjungtivitis dapat disebabkan oleh agen infeksi, seperti bakteri, klamidia, dan virus, serta alergi atau trauma. Infeksi bilateral mungkin menunjukkan bahwa hal itu disebabkan oleh agen infeksi atau alergi. **Tujuan:** Untuk memberikan wawasan kepada dokter hewan mengenai pengobatan kasus konjungtivitis dan faktor-faktor yang menghambat terapi. **Kasus:** Seekor anjing Shih-Tzu betina berumur tujuh tahun mengalami gangguan mata selama enam bulan sejak April 2023. Pemeriksaan fisik menunjukkan kemerahan pada mata kiri dan kanan dengan eksudat mukopurulen. Pemeriksaan laboratorium menggunakan impresi smear yang dilanjutkan dengan sitologi memastikan adanya peradangan pada mata dengan banyak sel neutrofil dan bakteri berbentuk kokus. Anjing tersebut didiagnosis menderita konjungtivitis bakterial dengan prognosis yang baik. **Manajemen Kasus:** Terapi terdiri dari pemberian antibiotik topikal berupa obat tetes mata Erlamycetin plus® (kloramfenikol dan deksametason) selama lima hari, dilanjutkan dengan salep mata Erlamycetin® (kloramfenikol). **Kesimpulan:** Setelah 12 hari terapi, tidak ada kemerahan pada mata anjing dan hanya terlihat sedikit eksudat. Namun, pada hari ke 14, pemilik melaporkan bahwa ada eksudat di mata anjingnya. Terapi yang dilakukan membuahkan hasil perbaikan namun belum maksimal karena pemiliknya tidak konsisten mengikuti anjuran.

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Kata kunci: Anjing; Bakteri; Bilateral; Konjungtivitis



INTRODUCTION

Conjunctivitis, also known as pink eyes, is an inflammation of the conjunctiva that is common in dogs and humans (Kumar *et al.*, 2016). The conjunctiva is an open mucous membrane that responds to antigenic stimulation caused by contact with dangerous stimuli (Pradnyantari *et al.*, 2018). Conjunctivitis can be caused by infectious agents, such as bacteria, chlamydia, and viruses, as well as allergies or trauma (Putra *et al.*, 2022). The bacteria commonly isolated from dogs' eyes are gram-positive bacteria, such as *Staphylococcus spp.*, *Bacillus spp.*, *Streptococcus spp.*, and *Treuperella spp.* Gram-negative bacteria, such as *Escherichia coli*, *Pseudomonas spp.*, *Neisseria spp.*, and *Klebsiella spp.*, are rarely found (Nadias *et al.*, 2021). Ectropion results in exposure of the conjunctiva, which can lead to conjunctivitis and keratitis. Dog breeds commonly reported to have conjunctivitis include Pug, Pekingese, Schnauzer, Cocker Spaniel, Bulldog, and Shih-Tzu (Triakoso, 2016; Nadias *et al.*, 2021). In North America, conjunctivitis is reported to occur in 0.3% to 1.52% of dogs annually (Dodi, 2015). In addition, this disease is also common in Europe. Meanwhile, there has been no report on the percentage of conjunctivitis cases in dogs in Indonesia. According to data from the Indonesian Animal Health Information System (Direktorat Jenderal Kesehatan Hewan, 2024), in the last three years nine incidents of conjunctivitis were reported, including: four cases in cats, four cases in goats, and one case in cattle.

Conjunctivitis can be divided into acute infection with a rapid onset time and a duration of less than three weeks, sub-acute infection with a duration of three to four weeks, and chronic infection with a duration of more than four weeks (Azari and Arabi, 2020; Irwan, 2017). Conjunctivitis can affect one eye (unilateral) or both eyes (bilateral) (Kumar *et al.*, 2016). Bilateral infection may indicate that it is caused by an infectious agent or allergy, while unilateral infection is more likely to be caused by toxic, chemical, or mechanical substances or lacrimal disorders (Yeu and Hauswirth, 2020). Conjunctivitis can be characterized by blood vessel congestion in the episclera, conjunctiva, or cornea (Kartini *et al.*, 2017). Acute infections are characterized by blood vessel congestion, oedema, and itching and may lead to an accumulation of bacterial growth, resulting in the appearance of severe, mucoid, or mucopurulent discharge (Dewi *et al.*, 2022). Untreated ocular infection can damage the structures of the eyes with possible blindness and visual impairments. Chronic conjunctivitis not only damages the conjunctiva, but can damage surrounding structures such as the eyelids and can become a potential source for other extraocular and intraocular infections (Teweldemedhin *et al.*, 2017). Several eye diseases in dogs, both primary and secondary, that affect the structure of the eye can cause blindness (Biondi *et al.*, 2022). Blindness in dogs is often caused by various acute and progressive diseases or trauma (Costa *et al.*, 2021).

Chronic bacterial conjunctivitis is used to describe conjunctivitis that lasts more than four weeks and is caused by a bacterial infection. The signs and symptoms include red eyes,

purulent or mucopurulent discharge, and chemosis. The incubation and transmission period is estimated to be between two and seven days. Bilateral eyelid problems, no itching, and no history of conjunctivitis are strong indicators of bacterial conjunctivitis (Azari and Barney, 2013). This case report presents the case of bilateral chronic conjunctivitis in a seven-year-old Shih-Tzu dog. To the best of the authors' knowledge, case reports on the incidence of chronic conjunctivitis in dogs in Indonesia are still limited. Therefore, it is hoped that this article can provide veterinarian with insight into the treatment of conjunctivitis cases and the factors that can hinder therapy.

CASE REPORTS

Signalment

A seven-year-old female Shih-Tzu named Kimmy weighed 6.5 kg and had brown hair and black eyes.

Anamnesis

The case dog presented with symptoms of runny nose and red eyes since April 2023. The owner had many dogs that were kept outdoors without cages in the house, but none of them suffered from the same symptoms as the case dog. The owner reported that the dog had suffered from a skin condition and had been treated by a veterinarian. On examination, the dog had a good appetite and was drinking. The owner provided commercial food in the form of dry food (Dog Choize®, PT. Perfect Companion Indonesia, West Jakarta) and drank from tap water. The dog had complete vaccination without annual booster.

Physical Examination

The examination was carried out at the Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University. A thorough physical examination was carried out on the dog's body, vital signs, and clinical status on October 4, 2023. The vital signs of the dog were normal as presented in **Table 1**. On physical examination the dog had difficulty opening its eyes and abnormalities were found in both eyes (bilateral), namely visible redness, excessive exudate mucopurulent (moderate) with greenish yellow color (**Figure 1**), and alopecia around the eyes. No abnormalities were found in other systems. The pupillary reflex and menace reflex in the case dog were still normal. The pupillary and menace reflexes were still normal in the case dog. The pupillary reflex was seen by the contraction of the pupil in the presence of light and the dilation of the pupil on the absence of light. Meanwhile, the menace reflex was seen from the animal's blink response, which was performed by slowly moving the hand slowly towards the animal's eyes (Kartini *et al.*, 2017).

Laboratory Examination

An impression smear examination was cytologically evaluate the condition of the eyes. Samples were taken by placing a sterile object lens on the eye and drying it. Subsequently, the samples were stained with Diff-Quik cytological stain and examined under a microscope. A hematological examination was also carried out using blood samples previously collected

from the dog. The haematological examination was carried out at the Tridatu Denpasar Veterinary Clinic. In the impression smear examination followed by cytology, inflammatory cells (neutrophils) and coccus-shaped bacteria were stained purple (Figure 2). It can be seen that neutrophil cells phagocytosed the bacteria. This indicates inflammation and infection in the eyes. Based on the results of the hematological examination, it was found that all parameters were still within normal limits (Table 2). Therefore, the inflammation was only localized in the eyes.

Table 1. Results of Clinical Examination

Parameter	Result	Normal Value*	Category
Heart Rate (x/minute)	108	65-145	Normal
Pulsus Frequency (x/minute)	104	65-145	Normal
Capillary Refill Time (CRT) (second)	<2	<2	Normal
Respiratory Frequency (x/minute)	24	12-30	Normal
Rectal Temperature (°C)	38.2	3.7-39.1	Normal

Note: Source: Mealey (2019).

Table 2. Results of Complete Blood Count

Item	Result	Reference*	Category
WBC	13.4 x 10 ³ /μL	6.0-17.0	Normal
LYM#	3.2 x 10 ³ /μL	0.8-5.1	Normal
MID#	0.7 x 10 ³ /μL	0.0-1.8	Normal
GRA#	9.5 x 10 ³ /μL	4.0-12.6	Normal
LYM%	23.7%	12.0-30.0	Normal
MID%	5.5%	2.0-9.0	Normal
GRA%	70.8%	60.0-83.0	Normal
RBC	5.92 x 10 ⁶ /μL	5.50-8.50	Normal
HGB	12.6 g/dL	11.0-19.0	Normal
MCHC	31.1 g/dL	30.0-38.0	Normal
MCH	21.2 pg	20.0-25.0	Normal
MCV	68.4 fL	62.0-72.0	Normal
RDWCV	14.4%	11.0-15.5	Normal
RDWSD	31.4 fL	20.0-80.0	Normal
HCT	40.4%	39.0-56.0	Normal
PLT	172 x 10 ³ /μL	117-460	Normal
MPV	9.6 fL	7.0-12.9	Normal
PDW	11.5 fL	5.0-20.0	Normal
PCT	0.165%	0.100-0.500	Normal
P-LCR	31.7%	10.0-70.0	Normal

Note: WBC: White Blood Cell; Lymph: Lymphocyte; Mid: Mid-Size Cell; Gran: Granulocyte; RBC: Red Blood Cell; HGB: Hemoglobin; MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin Concentration; RDW_CV: Red Cell Distribution Width Coefficient Variation; RDW_SD: Red Cell Distribution Width Standard Deviation; HCT: Hematocrit; PLT: Platelet; MPV: Mean Platelet Volume; PDW: Platelet Distribution Width; PCT: Procalcitonin. *Cell-800Vet, ICUBIO.

Diagnosis and Prognosis

Based on the results of the historical, physical, and laboratory examinations, the dog was diagnosed with conjunctivitis with a good prognosis due to its general good health and the reddish lesions in the eyes and mucopurulent discharge were found to be reversible and curable.

Treatment

The therapy administered to the dog included cleaning the eye exudate with 0.9% NaCl and Erlamycetin plus® (Chloram-



Figure 1. Eye Redness (Red Arrow) And Mucopurulent Exudate (Blue Arrow).

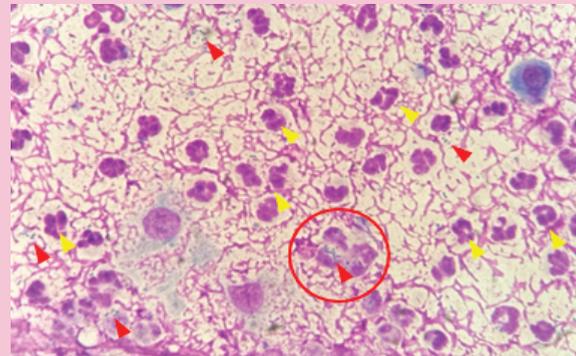


Figure 2. Neutrophil Cells (Yellow Arrows) Phagocytosing Bacteria (Red Circles) and Coccus-Shaped Bacteria (Red Arrows)(Blue Arrow).

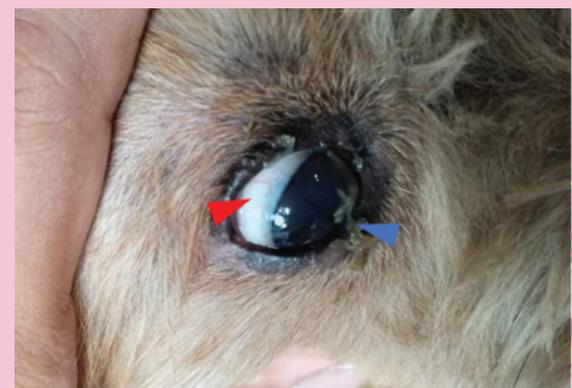


Figure 3. Redness Had Subsided (Red Arrow), but Exudate Was Still Visible (Blue Arrow) on Day 5.

phenicol) eye drops (PT Erela, Semarang, Indonesia) as causal therapy by giving one drop TID (Ramsey 2011) in the eyes for five days. The ingredients of Erlamycetin plus® are chloramphenicol, which is a broad-spectrum antibiotic that has no contraindications for intra-orbital use, and dexamethasone, which is a glucocorticoid anti-inflammatory agent that plays a role in reducing or suppressing the inflammatory

process. In addition, the owner was instructed to regularly clean the exudate from the eyes with cotton or tissue moistened with water or 0.9% NaCl. The owner was also asked to shave the hair around the face and bathe the dog once a week to prevent further irritation from the Shih-Tzu's long hair, which can get into the eyes and dirt stuck to the hair can be a potential source of infection. Five days after treatment, it was



Figure 4. Very Little Exudate Was Observed in The Eye (Red Arrow) on Day 12.

DISCUSSION

Conjunctivitis is an inflammation of the conjunctival tissue that lines the eyelids and covers the sclera (Pradnyantari *et al.*, 2018). Conjunctivitis can be caused by infectious agents such as bacteria, chlamydia, and viruses, as well as allergies or trauma (Putra *et al.*, 2022). Conjunctivitis can be characterized by blood vessel congestion in the episclera, conjunctiva, or cornea (Kartini *et al.*, 2017). Acute infections are characterized by blood vessel congestion, oedema, and itching and may lead to an accumulation of bacterial growth, resulting in the appearance of serous, mucoid, or mucopurulent discharge (Dewi *et al.*, 2022). Chronic infections are characterized by mucopurulent discharge that lasts for more than a few weeks (Haq *et al.*, 2013).

The dog suffered from bilateral conjunctivitis with redness and mucopurulent exudate in both eyes. It was assumed that the conjunctivitis was caused by bacteria due to the presence of mucopurulent exudate and its bilateral nature. According to Yeu and Hauswirth (2020), infections that occur bilaterally may indicate that the infection is caused by an infectious agent or allergy, while unilateral infections are more likely to indicate of toxic, chemical, mechanical, or lacrimal disorders. In addition, mucopurulent exudates and dry exudates in the morning around the eyes indicate bacterial infection (Weir 2002). According to the owner's report, the symptoms had been present for six months, beginning with redness in the eyes and progressing to ocular discharge. Based on the duration, the dog has chronic conjunctivitis. Conjunctivitis lasting longer than three weeks can be considered chronic (Elsayed *et al.*, 2020). Moreover, the dog did not appear to have any itching. Conjunctivitis due to bacterial infection is very typically characterized by stiff eyelids due to the accumu-

lation of dry exudate, no itching, and no history of conjunctivitis (Yeu and Hauswirth, 2020).

An impression smear examination followed by cytology was performed to support the clinical findings. Impression smears provide conjunctival epithelial components with good morphological features, although they are not superior to scrapings or cytobrushing for collecting cells. This technique is suitable for investigating superficial conjunctival diseases because the cells that can be easily detached will remain in the preparation (Athanasidou *et al.*, 2018). On microscopic examination, a sample of dog's eyes was found to contain many neutrophil cells and coccus-shaped bacteria. According to the findings of Berzina *et al.*, (2022), there are differences in cytological findings between dogs with healthy eyes and those with conjunctivitis. The study found that dogs with conjunctivitis had more epithelial cells, goblet cells, and neutrophils compared to dogs with healthy eyes. Based on this, the dog was confirmed to have conjunctivitis by the presence of many neutrophil cells, which supported the previous clinical findings. The bacteria that may have infected the dog, judging from the coccus-shaped bacteria observed, were *Staphylococcus spp.*, *Streptococcus spp.*, or *Neisseria spp.* In this case, bacterial identification was not carried out because the focus was on diagnosis and treatment of disease as well as the limitations of the tools and materials in this study. The presence of bacteria that attack the conjunctiva triggers an inflammatory response. Inflammatory cells such as neutrophils, eosinophils, basophils, lymphocytes, and plasma cells attack bacteria, but also act as cells that damage the structure of the conjunctiva. These cells then mix with fibrin and mucus resulting from goblet cell excretion to form conjunctival exudate. The exudate dries up and sticks to the upper eyelid and lower eyelid. As a result, epithelial oedema, conjunctival exfoliation, epithelial hypertrophy, and granuloma formation occur. In addition, oedema in the conjunctival stroma and hypertrophy in the lymphoid glands of the conjunctivitis stroma occur (Garcia-Posadas *et al.*, 2016; Gipson, 2016).

Chronic infections represent a major problem in animal health. The difficulty in controlling antibiotics would be more easily understood if microorganisms from chronic foci showed high antibiotic resistance, or if immunodeficiency was consistently observed in patients with chronic infections. However, numerous cases of chronic infections exist, in which the pathogen is susceptible to antibiotics and the immune system is normal. This may explain why chronic infections are difficult to treat, but does not explain their primary focus in the host. Only infectious microorganisms cause chronic infections. The normal microflora is the most infectious microorganism, with all species becoming infected immediately after birth because this microflora is permanently required by the host (Malyshkin, 2014).

Hematological examination of the dog revealed that all parameters were within normal limits. In general, inflammation will result in an increase in the number of leukocytes. However, not all diseases or patients will show an increase in

leukocytes during inflammation or the presence of pathogens. Farkas (2020) suggested that several patients who presented with bacteremia could have leukocyte counts within normal limits when a hematological examination was conducted. Chmielewski and Strzelec (2018) also suggested that chronic systemic inflammation and subclinical diseases associated with unhealthy diet, lifestyle, or general poor health can manifest in leukocyte counts that are within the normal range, but may still signal a health problem. This was found in the study by Petric *et al.*, (2018) on dogs suffering from heart failure. The study found that systemic inflammation can occur in cases of heart failure with normal hematological results. However, it must be noted that the results are not specific and must be interpreted based on the history and clinical signs, as well as other more specific laboratory examinations. This indicates that local inflammation did not alter the composition of the blood in circulation.

The choice of therapy using Erlamycetin plus® eye drops (PT Erela, Semarang, Indonesia) was based on the presence of localized inflammation in the eye. Therefore, topical antibiotics were chosen. The active ingredient of Erlamycetin plus® is chloramphenicol, which is a broad-spectrum antibiotic that has no contraindications for intra-orbital use (Ramsey, 2011). In conjunctivitis therapy, the use of broad-spectrum topical antibiotics is strongly recommended. Therefore, chloramphenicol was selected as the first-line drug in this therapy (Watson *et al.*, 2018). Chloramphenicol exerts bacteriostatic effects by binding to the 50S ribosomal subunit of susceptible bacteria, thereby inhibiting bacterial protein synthesis (Plumb, 2008). Meanwhile, dexamethasone is an anti-inflammatory glucocorticoid which plays a role in reducing or suppressing the inflammatory process (Erlangga *et al.*, 2015). Glucocorticoids can reduce the levels of T lymphocytes in circulation, inhibit lymphokines, inhibit the migration of neutrophils, macrophages, and monocytes, reduce interferon production, inhibit phagocytosis and chemotaxis, antigen processing, and reduce intracellular killing (Plumb, 2008). The eye drop dosage form was selected for its ease of administration. The inflammation in the dog's eyes appeared to subside five days after treatment. Therefore, the therapy was changed to using Erlamycetin® eye ointment (PT. Erela, Semarang, Indonesia), which only contains chloramphenicol. This was done because the exudate coming out of the dog's eyes was still productive, indicating the need for continued topical antibiotic use. It is necessary to monitor the administration of anti-inflammatory agents because prolonged use can lead to an increase in intraocular pressure, thereby increasing the risk of glaucoma, cataracts, and exophthalmos (Plumb, 2008).

Post-therapy evaluation was carried out 14 days after the examination. On the fifth day after treatment, the redness in the eyes had subsided (Figure 3), although the exudate remained visible but was noted to have decreased. On the seventh day the owner reported only a small amount of exudate observed in the eyes. On day 12, the owner reported very little exudate observed in the eyes (Figure 4) and the dog appeared comfortable. However, on day 14, the owner once

again reported the presence of exudates in the dog's eyes. In a case report of conjunctivitis in a pug dog by Putra *et al.*, (2022), it showed that the cloudiness of the eyeball was reduced, lacrimation and exudate were reduced, the inflammation and redness of the conjunctiva of the eye had decreased after seven days of administering Erlamycetin® eye ointment (PT. Erela, Semarang-Indonesia) TID, accompanied by cleaning dry exudate on the eyelids regularly with cotton or wet tissue and administering supportive vitamin therapy (Calvidog®) SID. Pradnyantari *et al.*, (2018) in their case report, conjunctivitis in a mixed breed dog, on the 14th day showed the eyes were clear without serous conditions, the lens color was normal, and the dog was active and could see as before with administration a water-containing alkaline eye drop with a pH of 8-11 (base) dripped BID.

The duration of the therapy was constrained by the practice of releasing the dog into the house without being caged. In addition, the case dog was not routinely bathed during the course of treatment, which could have resulted in the accumulation of dirt on the hair around the eyes, potentially causing irritation. The long hair of the Shih-Tzu dog can get into the eyes and cause irritation. Therefore, it is crucial to maintain the cleanliness of the animal's hair by bathing regularly and isolating it during the course of treatment to ensure successful treatment outcomes.

CONCLUSION

Based on the anamnesis, clinical examination, and laboratory examination, it was found that the dog had conjunctivitis with a good prognosis. The case dog was treated with topical antibiotics and topical anti-inflammatory agent. The therapy resulted in improvements, but was not optimal. It is essential that owners provide consistent and committed care care for their pets, especially by ensuring cleanliness and avoiding contact with the dog's hair, which can irritate the eyes and prevent recurrent infections.

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CONFLICT of INTEREST

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

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ETHICAL APPROVAL

This study did not require ethical approval.

AUTHORS' CONTRIBUTIONS

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

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