



Feline Pygranulomatous Panophthalmitis with *Histoplasma capsulatum* infection

K. A. Al Salihi^{1*},

¹ Head of Department of veterinary Internal Medicine, College of Veterinary Medicine, Al Muthanna University/ Iraq.

* Corresponding Author: kama_akool18@yahoo.co.uk, kama-akool18@mu.edu.iq

ARTICLE INFO

Received: 02.02.2019
Revised: 17.02.2019
Accepted: 03.03.2019
Publish online: 15.03.2019

***Corresponding author:**

K. A. Al Salihi
 Email address:
kama-akool18@mu.edu.iq

Abstract

Mycotic Pygranulomatous Panophthalmitis and Uveitis is a moderately usual reason for infections blindness in feline and canine. The present study reports a case of 4 months, cachectic, female domestic shorthair cat (*Felis domesticus*) presented to the veterinary clinic with bilateral enlarged eyeballs

and pus oozy conjunctiva. The clinical examination showed severe endophthalmitis, blindness, and buphthalmia of both eyes. The eyes were treated topically with antimicrobial eye ointment and dexamethasone. Moreover, a systemic antibiotic was also injected for five days. Eyes lesions progressively worsened over the next few weeks and the cat euthanized and submitted for necropsy. Grossly, both eyes bulged forward with a cloudy cornea. The sclera of both eyes was composed of bulging proliferative white tissue. Cytology examination revealed a mixed inflammatory cell with a majority of neutrophils. Moreover, macrophages with yeast like organisms were also seen. The histopathological examination of the cross and sagittal sections of the eyes revealed that all layers of the globe comprising the iris, portions of the cornea and eyelids were effaced by sheets of macrophages distended with fungus and necrotic debris. Moreover, eye sections stained with Grocott's methenamine silver stain revealed positive rounded yeast like organs probably *Histoplasma capsulatum*. In conclusion, this case study is reported for the first time pygranulomatous panophthalmitis with *Histoplasma capsulatum* infection in cat in Iraq. It is important that awareness should be considered by the veterinarian during treatment these cases, in addition to aware the owners because Histoplasmosis is one of the important zoonotic diseases. The author recommends doing more epidemiological studies on dog and cat eye diseases in Iraq to investigate the more common causative agents.

To cite this article: K. A. Al Salihi. (2019). Feline Pygranulomatous Panophthalmitis with *Histoplasma capsulatum* infection. MRVSA. 8 (1), 30-35. doi: <http://dx.doi.org/10.22428/mrvsa-2019-00813>

Keywords: Blindness, Buphthalmia, *Felis domesticus*, *Histoplasma capsulatum*, Pygranulomatous Panophthalmitis.

Introduction

A severe case of mycotic ocular infection is called pyogranulomatous panophthalmitis. It is fewer than a bacterial infection. Most cases of feline and canine

ocular mycotic infection are usually associated with systemic diseases (Ford, 2004). It is important to detect the mycotic ocular infection at the early stage for protection vision and treatment of systemic infection (Krohne, 2000). Histoplasmosis, blastomycosis, cryptococcosis, and coccidioidomycosis are the most common mycotic infections and collectively can make about 95% of ocular diseases with systemic infections (Ford, 2004; Linek, 2004; Krohne, 2000; Foil, 1998). Certain mycotic ocular infections do not occur from systemic spread to the eye but result from locally infected wounds (Ben-Simon *et al.*, 2002; Krohne, 2000). The mycotic ocular disease may be present for months before systemic diseases are diagnosed (Foil, 1998). *Histoplasma capsulatum* is a dimorphic fungus that causes a systemic infection called histoplasmosis. It is distributed worldwide in temperate and subtropical environments and infects human and a broad variety of mammalian species (Horwath *et al.*, 2015). Histoplasmosis has been reported in the USA (Brömel and Sykes, 2005; Nett *et al.*, 2015), Brazil in human (Zancopé-Oliveira *et al.*, 2008; Rocha-Silva *et al.*, 2014) and in cat (De Souza *et al.*, 2015; Carneiro *et al.*, 2005; Brilhante *et al.*, 2012). Bats nearby the house, conserved interior plants, unfinished basements and burrowing outside soil, are all the potential origin of contact to *Histoplasma sp.* spores for animals, especially cats, (Reinhart *et al.*, 2012). The inhalation and possibly by ingestion of conidia from the mycelial phase are the mode of fungus infection to the susceptible hosts. Later on, conidia convert to the yeast form in the host lungs and lymph nodes. The yeast cells live and proliferate inside macrophages and transported to systemic organs by a mononuclear system (Atiee *et al.*, 2014; Kobayashi *et al.*, 2009). The clinical signs of systemic histoplasmosis include fever, dyspnea, cough, intolerance to exercise, weight loss and lymphadenopathy (Reinhart *et al.*, 2012). Moreover, liver, lymph nodes, lungs, bone marrow, and eyes are the most affected organs (Brömel and Sykes, 2005). However, skin lesions are not usual in animals (Raskin, 2001). Histoplasmosis diagnosis is depended on clinical signs, radiographic abnormalities, cytological and histopathological investigations (Clinkenbeard *et al.*, 1987; Brömel and Sykes 2005). The culturing and identification of *Histoplasma* fungus (mycelial phase) in the laboratory is not the principal option due to its high risk of infection for the laboratory personnel (Brömel and Sykes 2005). The inflammation of all ocular tunica and involves the end stage of uveitis is called panophthalmitis. The series of severe uveitis were causing irreversible glaucoma quickly. Moreover, the infectious uveitis leads to secondary glaucoma that was resulting from obstruction of the drainage angle by inflammatory cells (Slatter, 2001). The end stage of glaucoma is hard to control because other systemic signs of fungal infection are limited that delay the fungal treatment (Krohne, 2000). Review of literature concerning feline pyogranulomatous panophthalmitis revealed no previous publications in Iraq. The present study reports a case of feline pyogranulomatous panophthalmitis, in addition to identification the causative agent using cytological, histopathological investigations.

Case report

Four months, cachectic female domestic shorthair cat (*Felis domesticus*) presented to the veterinary clinic with bilaterally enlarged eyeballs and mucopurulent discharge oozing from hyperemic conjunctiva. Upon clinical examination, the cat showed severe

endophthalmitis, blindness, and buphthalmia of both eyes (Figure. 1). The eyes were cleaned and treated locally with antimicrobial eye ointment and dexamethasone, moreover systemic antibiotic was also injected for five days. Lesions were progressively worsened over the next few weeks and the cat euthanized and submitted for necropsy. Grossly, both eyes bulged forward with a cloudy cornea. The sclera of both eyes was composed of bulging proliferative white tissue. Eye impression was collected for cytological examination and stained by Grocott's methenamine silver stain for the fungus investigation. Eyes were obtained and submitted for histopathological examination. The cytological examination revealed mixed inflammatory cell with the majority of neutrophils. Moreover, macrophages with yeast like organisms were also seen. The cross histopathological sections of the eyes revealed that all layers of the globe comprising the iris, portions of the cornea and eyelids were effaced by sheets of macrophages distended with fungus and necrotic debris. Moreover, the examination of sagittal sections of the globe showed a marked cellular exudate that expanded and effaced the sclera and choroid. Furthermore, eye sections stained with Grocott's methenamine silver stain revealed positive rounded yeast like organs (Figure.2).



Figure. 1: shows A 4 months, cachectic female domestic shorthair cat (*Felis domesticus*) presented to the veterinary clinic with bilaterally enlarged eyeballs and mucopurulent discharge oozing from hyperemic conjunctiva. The case was diagnosed as chronic, severe, bilateral granulomatous panophthalmitis and blepharitis with intracellular fungal infection probably *Histoplasma capsulatum* based on both cytological and histopathological features. (Left).

Figure. 2: Shows sagittal sections of cat globe stained with Grocott's methenamine silver stain revealed positive rounded yeast like organs. (X 20) (Right).

Based on both cytological and histopathological features the diagnosis of this case is chronic, severe, bilateral granulomatous panophthalmitis and blepharitis with intracellular fungal infection probably *Histoplasma capsulatum* because the fungal

culture was not done because of the high risk of this fungus on the laboratory personnel.

Discussion

This feline case report was diagnosed as chronic, severe, bilateral granulomatous panophthalmitis and blepharitis with intracellular fungal infection probably *Histoplasma capsulatum* based on both cytological and histopathological features. This is the first feline bilateral granulomatous panophthalmitis presentation in our veterinary clinic. The topical and systemic treatment revealed poor response to uveitis and glaucoma. The poor response to treatment and progressively worsened of the lesions over next few weeks led the owner to decide to euthanize the cat and submit it for necropsy. At necropsy, both eyes bulged forward with a cloudy cornea. The sclera of both eyes was composed of bulging proliferative white tissue, these findings are compatible with previously reported observations of another researcher (De Souza *et al.*, 2015; Wen-Chih *et al.*, 2005). Histopathological examination in both cross and sagittal sections of the cat eyes revealed invading of different kinds of inflammatory cells especially the macrophages distended with fungus and necrotic debris. Moreover, the positive results of eye sections stained with Grocott's methenamine silver stain approved the presence of rounded yeast like organs probably *Histoplasma capsulatum*. These histopathological features are in agreement with previous studies (De Souza *et al.*, 2015; Wen-Chih *et al.*, 2005; Clinkenbeard *et al.*, 1987; Brömel and Sykes, 2005). The high risk of *Histoplasma capsulatum* as zoonotic infection for the public and laboratory personnel, was the obstacle in culturing of the fungus in this study. According to previous studies (Brömel and Sykes, 2005), mentioned that the culturing and identification of *Histoplasma fungus* (mycelial phase) in the laboratory is not the first option because of the high risk of infection of laboratory personnel. Dogs are a very susceptible host for histoplasmosis and canines are considered as patrol animals (Percy, 1981; Gwin, 1980). However, while the feline appears less susceptible to the disease, ocular appearances of histoplasmosis are more frequently encountered in the cat (Stiles, 2006). *Histoplasma capsulatum* is a soil-borne dimorphic fungus (Green, 2006). It maintains best in moist soil containing nitrogen-rich organic matter such as bird or bat feces. Moreover, the fungus can grow in moist soil associated with house plants. Therefore, indoor cats can be at risk. As blastomycosis, the disease is acquired by inhalation of fungal microconidia. The incubation period is 12 to 16 days. The microconidia reach the lungs convert to the yeast form which is phagocytized by macrophages, where they undergo further intracellular replication. Then, the fungus is disseminated via the lymphatic and circulatory system. Histoplasmosis infects the eye causing conjunctivitis, granulomatous blepharitis, granulomatous chorioretinitis, retinal detachment, and optic neuritis.

In conclusion, this case study presented pyogranulomatous panophthalmitis due to *Histoplasma capsulatum* infection in the cat. This is an important clinic case in cat and awareness should be taken by the veterinarian who treats this case, as well as the owners as this disease is one of the critical zoonotic diseases. For the author's knowledge, this is the first case that reported in the cat in Iraq. The author recommends

doing another epidemiological study on feline and canine eye diseases with emphasis on the causes of these diseases.

References

Atiee G, Kvitko- white H, Spauding K, Johnson M. (2014). Ultrasonographic appearance of histoplasmosis identified in the spleen in 15 cats. *Veterinary Radiology Ultrasound*, v. 55, n.3, p. 310-314.

Ben-Simon GJ, Grinbaum A and Barequet IS. (2002). More than tears in your eyes (*Exophiala jeanselmei* keratitis). *Cornea* 21: 230-231.

Brömel C, Sykes JE. (2005). Histoplasmosis in dogs and cats. *Clinical Techniques in Small Animal Practice*, v. 20, p. 227-232.

Brilhante RSN, Coelho CGV, Sidrim JJC, Lima RAC, Ribeiro JF, Cordeiro RA, Castelo-Branco DSCM, Gomes JMF, Simões-Mattos L, Mattos MRF, Beserra HEO, Nogueira GC, Pinheiro AQ, Rocha MFG. (2012). Feline Histoplasmosis in Brazil: clinical and laboratory aspects and a comparative approach of published reports. *Mycopathologia*. 173:173-193.

Carneiro RA, Lavalle GE, Araújo RB. (2005). Histoplasmosse cutânea em gato: relato de caso. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*. 57:158-161.

Clinkenbeard KD, Cowell RL, Tyler RD. (1988). Disseminated histoplasmosis in dogs: 12 cases (1981-1986). *Journal of the American Veterinary Medical Association*, 193;11: 1443-1447.

De Souza WE, Gremião DFI, Pereira AS, Simone Cunha De S C, Borba MC. (2015). Feline histoplasmosis: a case of supraorbital involvement. *Histoplasmosse felina: relato de caso com envolvimento supraorbital*. *R. bras. Ci. Vet.*, v. 22, n. 2, p. 77-80, abr./jun.

Foil CS. (1998). Miscellaneous fungal infections. In: Greene CE ed. *Infectious Diseases of the Dog and Cat*. 2nd ed. Saunders. 420-430.

Ford MM. (2004). Antifungals and their use in veterinary ophthalmology. *Vet Clin North Am Small Anim Pract* 34: 669-691.

Green CE. (2006). Histoplasmosis. In: Greene CE, ed. *Infectious Diseases of the dog and cat*, 3rd ed. St. Louis, MO: Elsevier Saunders;577-584.

Gwin RM, Makley TA, Wyman M. (1980). Multifocal ocular histoplasmosis in a dog and a cat. *J Am Vet Med Assoc*. 176;638-642.

Horwath MC, Fecher RA, Deepe GS JR. (2015). *Histoplasma capsulatum*, lung infection and immunity. *Future Microbiology*.10, p. 967-975.

Krohne SG. (2000). Canine systemic fungal infections. *Vet Clin North Am Small Anim Pract* 30: 1063-1090.

Linek J. (2004). Mycotic endophthalmitis in a dog caused by *Candida albicans*. *Vet Ophthalmol* 7: 159-162.

Nett RJ, Skillman D, Riek L, Davis B, Blue SR, Sundberg EE, Merriman JR, Hahn CG, Park BJ. (2015). Histoplasmosis in Idaho and Montana, USA, 2012–2013. *Emerging Infectious Diseases*. 21;(6):1071-1072.

Percy DH. (1981). Feline histoplasmosis with ocular involvement. *Vet Pathol*. 18:163-169.

Raskin RE. (2001). Skin and subcutaneous tissues. In: Raskin, R.E.; Meyer, D.J. *Atlas of canine and feline cytology*, 1st ed. USA: W.B. Saunders Company. 50-51.

Reinhart JM, Kukanich KS, Jackson T, Harkin KR. (2012). Feline histoplasmosis: fluconazole therapy and identification of potential source of *Histoplasma* species exposure. *Journal of Feline Medicine and Surgery*.14; 2: 841-848.

Rocha-silva F, Figueiredo SM, Silveira TTS, Assunção CB, Campolina SS, Pena-Barbosa JPP, Rotondo A, Caligorne RB. (2014). Histoplasmosis outbreak in Tamboril cave – Minas Gerais state, Brazil. *Medical Mycology Case Reports*. 4: 1-4.

Slatter D. (2001). Glaucoma. In: *Fundamentals of Veterinary Ophthalmology*. 3rd ed. Saunders. 350-380.

Stiles J. (2006). Ocular infections. In *infectious diseases of the dog and cat*. 3rd ed., 974-991. Elsevier Saunders, St. Louis, Missouri.

Zancopé-Oliveira RM, Muniz MM, Vanke B. (2008). Histoplasmosis. In: Coura, J.R. *Dinâmica das doenças infecciosas e parasitárias*. Rio de Janeiro: Guanabara Koogan. 1207-1221.

Wen-Chih T, Chen-Hsuan L, Uh-Senq Y, Cheng-Hsiang H, 'YI-Chenq C, Chung-Tien L (2005). Case Report: Pyogranulomatous Panophthalmitis with Yeast-like Organism (Most Likely *Exophiala* spp.) Infection in a Dog. *Taiwan Vet J*. 31;(2): 92-96.