MICROSPORIDIAL KERATOCONJUNCTIVITIS IN A PET BEARDED DRAGON (*POGONA VITTICEPS*)

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Abstract

A 4-month-old female bearded dragon (*Pogona vitticeps*) was presented with unilateral conjunctivitis. The conjunctivitis was not responsive to topical antibiotic or anti-inflammatory therapy and continued to progress in severity. Conjunctival tissue was sampled and microsporidial conjunctivitis was diagnosed on histopathological evaluation of submitted samples. Medical therapy was initiated and included topical itraconazole, systemic itraconazole, and systemic fenbendazole. Serial serum chemistry panels and complete blood counts were monitored for potential side effects associated with the medications. Despite treatment, the conjunctivitis progressed and enucleation was performed. Histopathology on the enucleated globe confirmed the diagnosis of microsporidial keratoconjunctivitis. Systemic itraconazole was administered at 5 mg/kg orally for approximately 3 months. No abnormalities were detected on hematologic diagnostic testing during the treatment period. A computed tomographic scan was performed to monitor for systemic lesions, but no abnormalities were detected. About 12 months after initial presentation, the bearded dragon is healthy and there are no overt signs of disease. Copyright 2017 Elsevier Inc. All rights reserved.

Key words: microsporidiosis; conjunctivitis; keratoconjunctivitis; bearded dragon; itraconazole

A 4-month-old female bearded dragon (*Pogona vitticeps*) was presented with left superior blepharedema of unknown duration. The animal was obtained from a local pet store and the owners believed the animal had increased left blepharospasm at that time. The animal was maintained in a 40-gallon tank in which the environmental temperature within the enclosure varied from 27°C (maintained by 1, 10.0 UVB lamp) to 36°C (maintained with 2, 100 W basking spot lamps). There were no other animals in the home. Calcium and vitamin D_3 dusted crickets were fed on a daily basis. On examination, the left eye displayed evidence of blepharospasm with mucoid discharge. Ocular discharge cytology and culture were recommended but declined by the owner. The eye was cleansed with sterile ocular wash (Ocusoft, Inc., Richmond, TX USA) after administration of proparacaine (Akorn, Inc., Lake Forest, IL USA). Flurbiprofen (Bausch & Lomb Inc., Tampa, FL USA) was prescribed topically once daily for one week.

When re-examined after 1 week of treatment, an anterior segment ophthalmic examination was performed with slit-lamp biomicroscopy (Kowa SL15, Kowas Co. Ltd, Torrance, CA USA), revealing moderate blepharospasm, moderate blepharedema (inferior greater than superior), inferior chemosis, and hyperemia with overlying mucoid discharge lining the fornix and anterior

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fibrous tunic. The cornea was clear and no flare or other intraocular abnormalities were observed. Culture and antimicrobial sensitivity of bacteria isolated from a conjunctival swab was performed. Ofloxacin 0.3% (Akorn, Inc., Lake Forest, IL USA) was prescribed to be applied in the left eye every 12 hours pending culture and sensitivity results. Flurbiprofen 0.03% (Bausch & Lomb Incorporated, Tampa, FL USA) was increased in frequency to every 12 hours. The culture demonstrated abundant growth of a *Salmonella* spp. that was determined to be sensitive to ofloxacin.

On re-examination 17 days postinitial evaluation, the owner noted progression of clinical signs despite treatment. On examination, the entire periorbita and both inferior and superior palpebrae were severely chemotic (Fig. 1). The left eyelids were held closed. To treat the inflammation, oral meloxicam 0.3 mg/kg orally, every 48 hours (Ceva Animal Health, LLC, Lenexa, KS USA) was prescribed. At that time, if medical management continued to fail, the authors would recommend surgical intervention to improve the patient's level of comfort and informed the owner that there was a possibility that the bearded dragon may lose sight or use of the eye.

Re-evaluation was performed 27 days after the initial presentation. The owner noted exacerbation of chemosis immediately after application of topical medications, which seemed to improve within a few hours. On follow-up 1 week later (4 weeks and 6 days after initial presentation), the animal continued to demonstrate severe clinical signs (e.g., periorbital edema and severe chemosis) with no improvement. The topical treatments (ofloxacin and flurbiprofen) were discontinued at that time. The oral meloxicam was continued and a recheck appointment was recommended in 7 to 10 days. If there was no improvement in the swelling, a conjunctival biopsy and subsequent histopathological assessment of the submitted tissue would be in order.

Conjunctival incisional biopsy was performed under sedation 1 month and 23 days after initial presentation owing to the lack of treatment response of the eye. Hydromorphone 0.15 mg/kg intramuscular (West-ward, Eatontown, NJ USA) and alfaxalone 5 mg/kg intramuscular (Jurox, Inc., Kansas City, MO USA) were administered for the sedation. Using 0.3 mm Colibri forceps and iris scissors, a small slice of inferior bulbar conjunctiva was removed. The biopsy site was left to heal by second intention. Samples were submitted for aerobic culture and sensitivity and histopathological evaluation. The bearded dragon was released from the hospital and prescribed ofloxacin drops to be placed in the affected eye every 8 hours postprocedure until the next recheck appointment. Meloxicam at 0.2 mg/kg was to be administered once daily by mouth postprocedure for 2 days.

The culture and sensitivity of conjunctival tissue now demonstrated a light growth of *Salmonella* spp. that was sensitive to ofloxacin. The biopsy sample was sent to the Comparative Ocular Pathology Laboratory of Wisconsin at the University of Wisconsin-Madison for histopathological evaluation. Histopathology revealed a severe inflammatory infiltrate, composed largely of macrophages and fewer lymphocytes and plasma cells, infiltrating and expanding the conjunctival substantia propria with many intrahistiocytic, 3 to 5 μm diameter round to oval protozoal-like tachyzoites. The organisms were strongly positive under Gram stain, lightly Gomori silver stain positive, and negative under Fite's stain. Based on these findings a final diagnosis of granulomatous conjunctivitis with intralesional protozoal-like organisms suggestive of a microsporidium (a primitive fungus) was reported (Fig. 2).

At re-examination 10 days' postbiopsy (2 months 2 days after initial presentation), fenbendazole 50 mg/kg orally every 24 hours for five days was started. On examination, the left eye appeared unchanged. Ofloxacin drops were continued every 8 hours in the left eye. Flurbiprofen therapy was again added to the therapeutic regimen, once daily in the left eye, in addition to oral meloxicam every 48 hours. Topical itraconazole 1% ophthalmic ointment (Compounded, Wedgewood Pharmacy,

FIGURE 1. Seventeen days postinitial presentation. Note increased chemosis of the inferior palpebra and obstruction of the cornea by edematous conjunctival tissue.