

SUSPECTED FUNGAL KERATITIS IN A GIANT PANDA

Hiroki Kanno, Kenichi Yoshida, Ryoji Umemoto, Kumiko Hanaki

At Kobe Oji Zoo, we have a 24-year-old female giant panda. In the spring of 2017, we observed that there was clouding of the cornea on the surface of her left eye. We suspected that this was due to wound-induced keratitis, and treated her eye with antibiotic eye drops. However, the treatment was not effective and symptoms, such as corneal clouding and conjunctival hyperemia, worsened. We consulted an ophthalmologist who examined her and made the provisional diagnosis of fungal keratitis. Based on the diagnosis, we started treating with anti-fungal agents and observed improvements in her symptoms. After 4 months, keratitis was successfully treated although some clouding remained on the surface of the cornea.

Fungal keratitis is a rare disease that is difficult to diagnose and treat. It is caused by injury to the cornea and occurs when the immune system is compromised. Some studies suggest that various fungal species exist in the living environment of giant pandas and on bamboo; thus, our case may have been caused by a wound from bamboo or bamboo leaves that we fed to our panda. However, we have not changed the housing environment or the food, nor observed any changes in her foraging behavior. We noted that there were a few incidences of fungal dermatitis when she was pregnant and pseudopregnant, and this case occurred as she was approaching her pseudopregnancy. Therefore, we believe that fungal keratitis occurred in our panda as a result of a compromised immune system due to aging and pseudopregnancy.

SUSPECTED FUNGAL KERATITIS IN A GIANT PANDA

2019.11.12-14
Hiroki Kanno, Kenichi Yoshida,
Ryoji Umemoto, Kumiko Hanaki
Kobe Oji Zoo



Our case



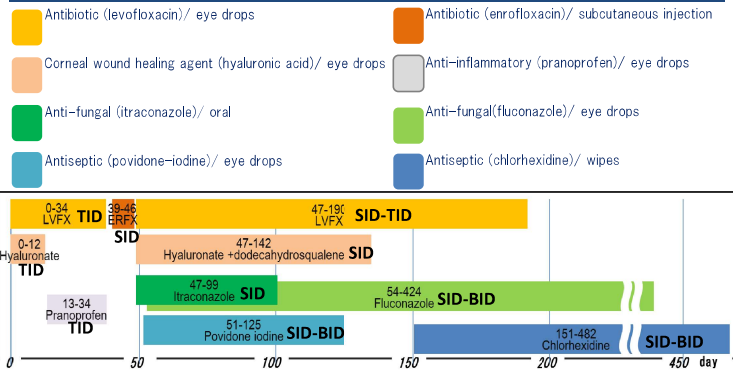
- Name
Tantan (Chinese name: Shuwanshuwan)
- Sex
female
- Birth place
Wolong Giant Panda Breeding Center
- Birthday
Sept 16, 1995
- At our zoo since July 16, 2000

Overview of the case

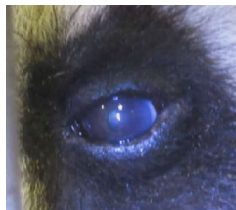


- Clouding of the cornea of the left eye was observed
- Treatment for keratitis was initiated
- Condition worsened
- Seen by an ophthalmologist
- Treatment for fungal keratitis was initiated
- Condition improved

Overview of the case



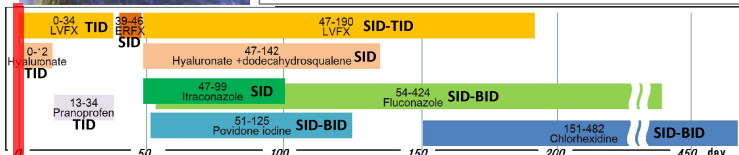
Treatment course of the left eye: Day 0 (2017/4/8)



● Symptom: Clouding of the center of the cornea

● Treatments

- Antibiotic (0.5% levofloxacin)/ eye drops
- Corneal wound healing agent (0.1% sodium hyaluronate)/ eye drops



Administration of the eye drops



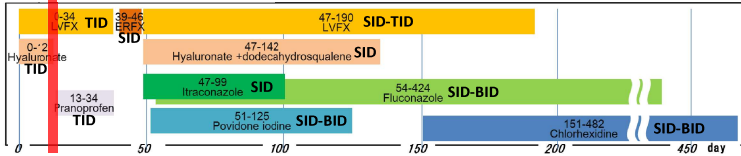
Tool: A syringe equipped with a feeding needle for small animals

Treatment course of the left eye: Day 12 (2017/4/20)



Symptoms
Worsening of the corneal clouding/swelling of the upper and lower eyelids

Treatments
 Antibiotic (0.5% levofloxacin)/ eye drops
 Anti-inflammatory (0.1% pranoprofen)/ eye drops

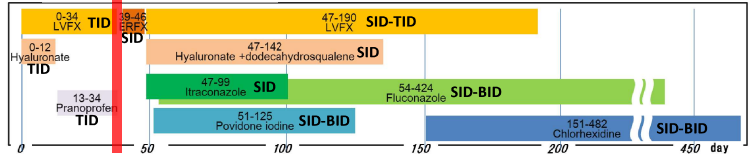


Treatment course of the left eye: Day 35 (2017/5/13)



Symptoms:
Progression of the corneal clouding/conjunctival hyperemia/hordeolum

Treatments
 Discontinued
 Training for subcutaneous injections

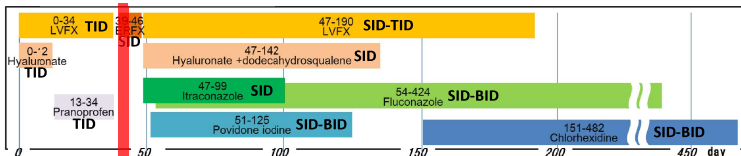


Treatment course of the left eye: Day 39 (2017/5/17)

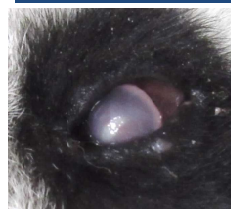


Symptoms:
Progression of the corneal clouding/conjunctival hyperemia/hordeolum

Treatment
 Antibiotic (5% enrofloxacin, 9 mL)/ subcutaneous injection

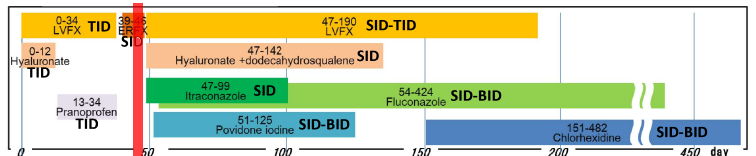


Treatment course of the left eye: Day 45 (2017/5/23)

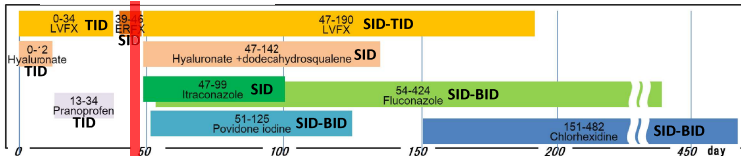
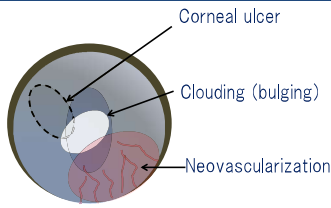
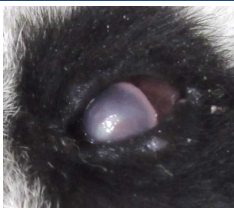


Symptoms
Bulging of the corneal clouding/neovascularization in the lower part of the cornea

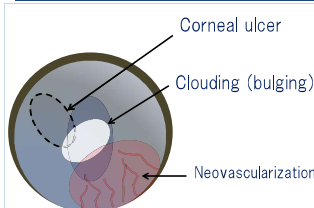
Treatment
 Antibiotic (5% enrofloxacin, 9 mL)/ subcutaneous injection



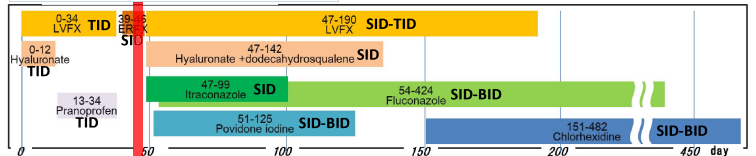
Treatment course of the left eye: Day 45 (2017/5/23)



Diagnosis by the ophthalmologist

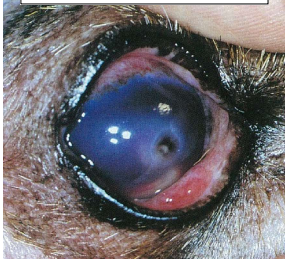


1. Corneal ulcer and clouding were distributed differently.
 2. The degree of clouding was more severe than what is normally seen in corneal ulcers.
 3. Neovascularization occurred toward the clouding region rather than the ulcer.
- ↓
Fungal keratitis with superficial corneal ulcer was suspected



What is fungal keratitis?

Fungal keratitis in a dog



Reference: Color Atlas of Canine and Feline Ophthalmology

- Inflammation of the cornea due to fungal infection
- Primarily induced by corneal injuries
- Develops when the immune system is compromised
- Characterized by localized lesions with severe inflammation
- Diagnosis is made based on cytology and curettage of the lesion

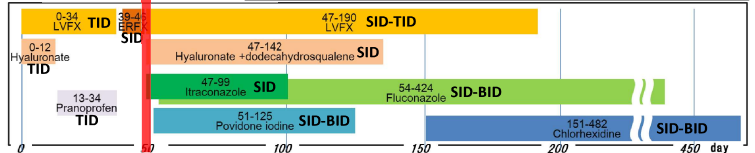
Treatment course of the left eye: Day 48 (2017/5/26)



● Symptoms: No changes

Treatments

- Anti-fungal (itraconazole, 400 mg)/ oral
- Antibiotic (0.5% levofloxacin)/ eye drops
- Corneal wound healing agent (0.3% sodium hyaluronate + 5% dodecahydroqualene)/ eye drops



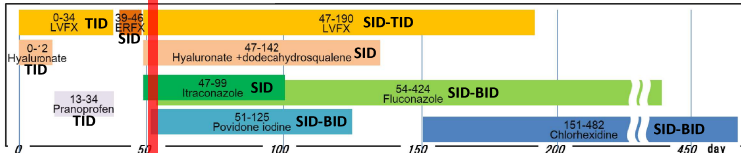
Treatment course of the left eye: Day 51 (2017/5/29)



● Symptoms: Reduced clouding

Treatments

- Anti-fungal (itraconazole, 400 mg)/ oral
- Antibiotic (0.5% levofloxacin)/ eye drop
- Corneal wound healing agent (0.3% sodium hyaluronate + 5% dodecahydroqualene)/ eye drop
- Antiseptic (0.1-0.5% povidone-iodine)/ eye drop



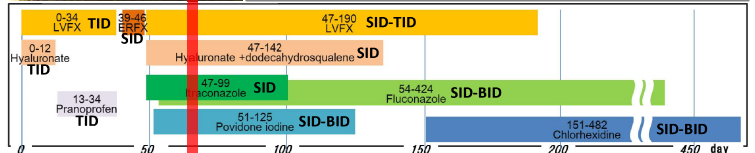
Treatment course of the left eye: Day 66 (2017/6/13)



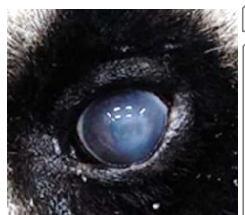
● Symptoms: Reduced clouding/disappearance of blood vessels/smoothing of the surface of the cornea

Treatments

- Anti-fungal (itraconazole, 400 mg)/ oral
- Anti-fungal (0.2% fluconazole)/ eye drops
- Antibiotic (0.5% levofloxacin)/ eye drops
- Corneal wound healing agent (0.3% sodium hyaluronate + 5% dodecahydroqualene)/ eye drops
- Antiseptic (0.1-0.5% povidone-iodine)/ eye drops



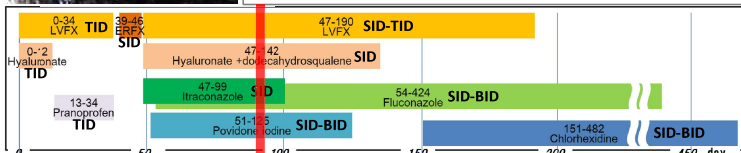
Treatment course of the left eye: Day 81 (2017/6/28)



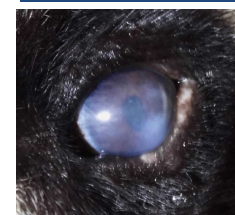
● Symptoms: Improved corneal opacity. Clouding of the cornea (inverted C-shaped)

Treatments

- Anti-fungal (itraconazole, 400 mg)/ oral
- Anti-fungal (0.2% fluconazole)/ eye drops
- Antibiotic (0.5% levofloxacin)/ eye drops
- Corneal wound healing agent (0.3% sodium hyaluronate + 5% dodecahydroqualene)/ eye drops
- Antiseptic (0.1-0.5% povidone-iodine)/ eye drops



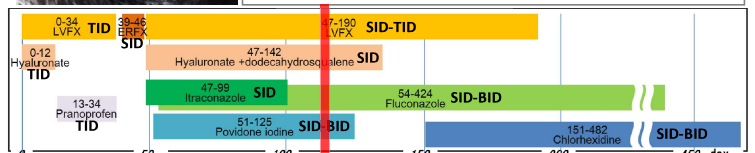
Treatment course of the left eye: Day 118 (2017/7/21)



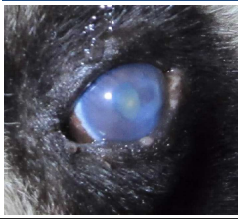
● Symptom: Clouding slightly improved

Treatments

- Anti-fungal (0.2% fluconazole)/ eye drops
- Antibiotic (0.5% levofloxacin)/ eye drop
- Corneal wound healing agent (0.3% sodium hyaluronate + 5% dodecahydroqualene)/ eye drop
- Antiseptic (0.1-0.5% povidone-iodine)/ eye drop



Treatment course of the left eye: Day 147 (2017/9/2)

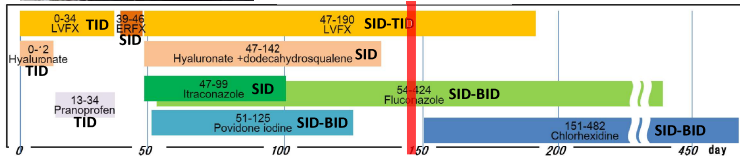


● **Symptom:** Clouding slightly improved/recurrence of hordeolum

● **Treatments**

■ Anti-fungal (0.2% fluconazole)/ eye drops

■ Antibiotic (0.5% levofloxacin)/ eye drops



Disinfecting around the eyelids



Treatment course of the left eye: Day 413 (2018/5/26)

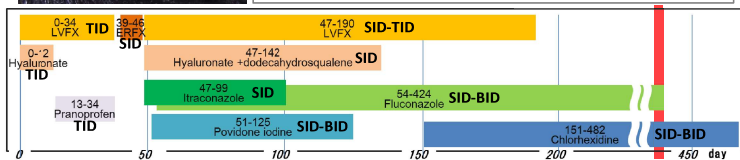


● **Symptoms:** No changes

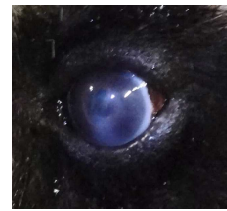
● **Treatments**

■ Anti-fungal (0.2% fluconazole)/ eye drops

■ Antiseptic (0.02% chlorhexidine)/ wipes



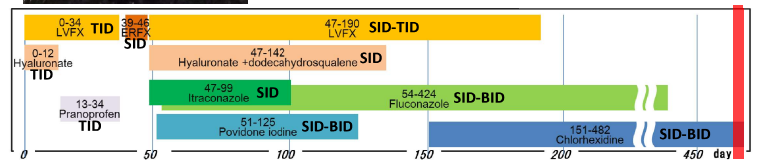
Treatment course of the left eye: Day 546 (2018/10/6)



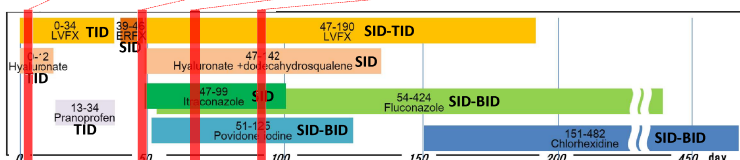
● **Symptoms:** No changes

● **Treatment**

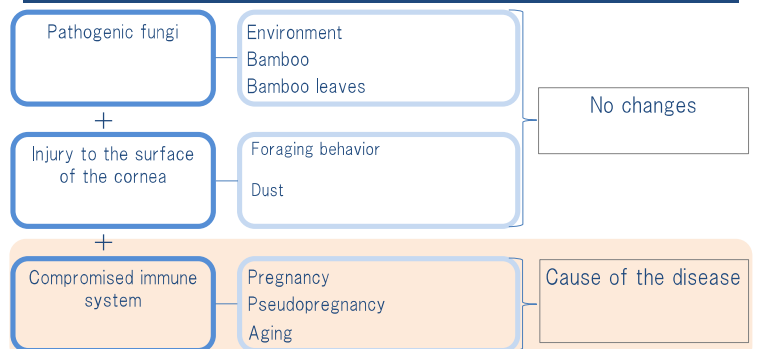
■ Antiseptic (0.02% chlorhexidine)/ wipes



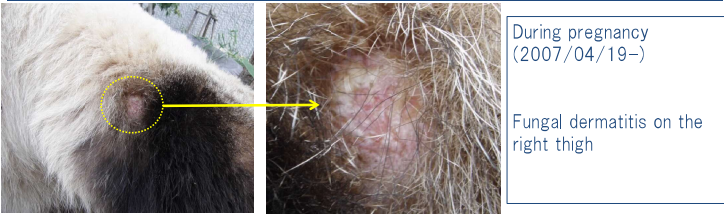
Treatment course of the left eye



Discussion

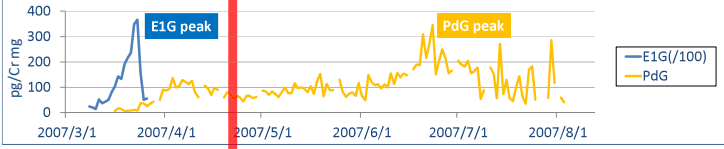


Discussion



During pregnancy
(2007/04/19-)

Fungal dermatitis on the
right thigh

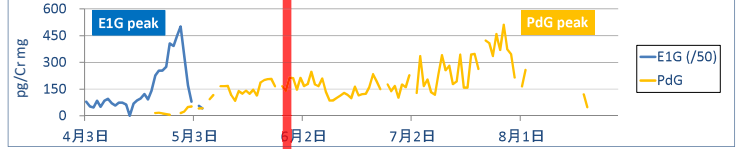


Discussion



During pregnancy
(2008/05/29-)

Fungal dermatitis on the
right back

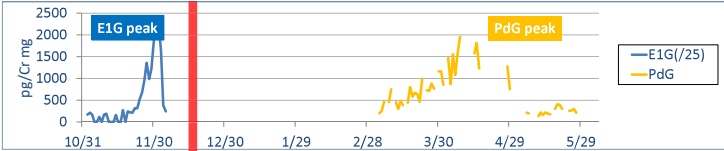


Discussion

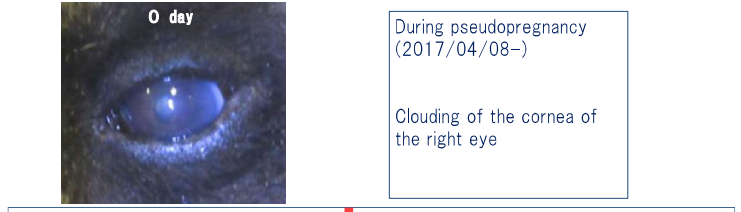


During pseudopregnancy
(2013/12/11-)

Hair loss on the 5th finger of
the right paw

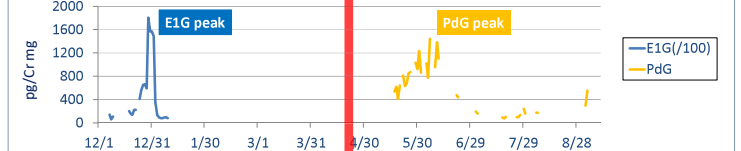


Discussion



During pseudopregnancy
(2017/04/08-)

Clouding of the cornea of
the right eye



Summary



Pseudopregnancy

Aging

Compromised
immune system

Fungal keratitis

