

Case Report: Sparganosis in Domestic Cat

(STUDI KASUS: SPARGANOSIS PADA KUCING LOKAL)

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ABSTRACT

Sparganosis is one of the food borne zoonotic diseases caused by the *plerocercoid* larvae (spargana) of the *Spirometric* genus. Sparganosis cases in five-month-old female cats in Denpasar, Bali were reported by us. Clinical sign of a *Spirometric* tapeworm infection in the case cat of the fecal consistency is grade 3.5. These findings are reported from animal's owners who found worms when defecate. Eggs per gram (EPG) 16,900 it shows the intensity of spirometra infection in cat high enough. The Animal were treated with praziquantel 0.5 tablets, given twice with a seven-day interval. Evaluation of the cat after two times treatments for clinical signs of significant changes only from the fecal effusion from grade 3.5 to grade 2 was well formed, does not leave a mark when picked up.

Key words: sparganosis; Spirometra; domestic cat; zoonotic

ABSTRAK

Sparganosis merupakan salah satu penyakit *food borne* zoonosis yang disebabkan oleh larva *plerocercoid* (spargana) dari genus *Spirometra*. Kasus sparganosis pada kucing lokal betina usia lima bulan di Denpasar, Bali dilaporkan oleh kami. Klinis yang tampak dari infeksi cacing pita *Spirometra* pada kucing kasus yaitu konsistensi feses *grade* 3,5. Temuan ini dilaporkan oleh pemilik hewan yang menemukan cacing pada anus kucing kasus saat buang air di *litter box*. *Eggs per gram* kucing kasus yang didapat 16.900. Hal ini menunjukkan intensitas infeksi spirometra pada kucing kasus cukup tinggi. Hewan kasus ini diterapi dengan pemberian praziquantel untuk anak kucing ½ tablet dan diberikan sebanyak dua kali dengan tenggang waktu tujuh hari setiap pemberian. Evaluasi kucing kasus setelah dua kali pengobatan terjadi perubahan tanda klinis yang signifikan dari konsistensi feses dari *grade* 3.5 menjadi *grade* 2 yaitu berbentuk jelas, dan mudah diambil serta tidak lengket.

Kata-kata kunci: sparganosis; Spirometra; kucing local; zoonosis

INTRODUCTION

Sparganosis is a food borne zoonotic disease caused by *plerocercoid* larvae (spargana) from genus *Spirometra*. Cats are one of the definitive hosts, the larvae will develop into the adult stage in the intestines (Moges, 2014). The case of adult tapeworms has been reported several times in cats in the United States (Schmidt *et al.*, 1968). Sparganosis develops in cats when cats ingest *crustaceans* containing *procercoids*, which later develops into *parenteral*

Spargana. Source of transmission of *Spirometra* spp. to humans and other animals are the *Felidae* family and the *Canidae* family. The feces contain *Spirometra* spp eggs. which can pollute rivers, ponds, or other puddles. Frogs, snakes, and amphibians also act as a source of transmission to humans and other animals. Humans are mainly infected through consumption of undercooked meat from these animals, and also through drinking untreated water containing *Spirometra* larvae (Hughes and Biggs, 2002). In humans, the spargana can attack the brain, eyes, breast, spinal cord, and subcutaneous tissue, resulting in local tissue damage, paralysis, blindness, and death (Li *et al.*, 2011). Mueller (1974) said that the spargana clinical signs in cats are cysts under the skin.

Spirometra is spread in several countries including Europe, Africa, Australia, Japan, China, Korea, and Southeast Asia. In New South Wales and Queensland, East Australia, 5% of frogs (*Rana limnocharis* and *R. cancrivora*) the second intermediate host in the life cycle of *spiroметра* are infected with *spargana* (Berger *et al.*, 2009). In Malaysia, although there were no reported cases of human sparganum, 9–22% of frogs contained spargana (Mastura *et al.*, 1996). Some types of *spiroметра* related to the medical field are *S. erinacei* in Asia (Lee *et al.*, 1990), *S. mansoni* in the USA (Mueller, 1974), and *S. theileri* (Opuni, 1974).

The case of sparganum in Indonesia is rarely published, the results of the epidemiological and serological of sparganum have been reported in the provinces of Papua, North Sumatra, and Bali (Wandra *et al.*, 2006). The first occurrence of ocular sparganum in Indonesia was discovered in 1970 in Purwodadi, Semarang (Margono *et al.*, 2008). The prevalence of cestoda *Spirometra erinaceieuropaei* in cats reaches 33% while in dogs only 10%. This is in accordance with the habits of cats who usually hunt amphibians, reptiles, and small insects, therefore the prevalence in cats is higher than dogs (Wang *et al.*, 2011). The purpose of this case report is to determine sparganosis in domestic cat in Bali and prevention of sparganosis.

CASE REPORT

Signalement

On November 24, 2017 a black female domestic cat was examined, with a slight white color on the paws section of the four legs, half of the face, and lower abdomen, named Cingku, 5 months old, and weighing 1.4 kg. Cingku owned by Tessa Saputri Marmanto on Jalan Tukad Pakerisan Gang F Number 16.

Anamnesa

A week before the inspection date, the owner looked at the cat's anus after defecating and there was a worm about ± 10 cm length came out, the owner immediately pulled out the worm. The feces look soft but still have shape. Appetite and thirst is normal, the owner usually give commercial cat food and drinking water from well.

The domestic cat have been vaccinated and given anthelmintic (pyrantel pamoat) at one clinic in Bali. The cat is let loose when the owner is at home and caged when the owner is away. One of the neighbors have birds (sparrows, lovebird, and pigeons).



Figure 1. Worms coming out of the cat's anus

Clinical Examination

Physical examination is done to determine the condition of the cat. The praesens status of the cat is a normal body temperature of 38.4°C . Heart rate frequency 136 bpm, pulse frequency 130 bpm, breath frequency 30 times/minute, capillary reffil time (CRT) under two seconds. The data obtained from the cat are generally normal, the cat have a robust posture, normal skin and nails, normal limbs, normal musculoskeletal system, normal nervous system, normal circulation system, normal respiration system, normal urogenital system, abnormal digestion, normal mucosa (lips, eyelids, ears, genital area, and anus), and normal lymph nodes (mandibular, superficial cervical, axillary, superficial inguinal, and popliteal nodes). Digestion is not normal seen from the discovery of worms about ± 10 cm in the cat's anus after defecation (Figure 1) and feces grade 3.5 consistency soft but still has shape. When diagnosing an infection in animals, proglottids from the worm itself may have broken off and ended up in the feces along with eggs. The proglottids can be microscopically identified as being in the Order of *Pseudophyllidea* because they have medial genital pores, but the actual genus of the worm could not be specifically identified from proglottids alone. The specificity of the worm genus

or species would require differentiation based upon the uterus and egg morphology (Moges, 2014). The worms has a pair of suction slits and a simple spiral shaped uterus.

Laboratory Examination

Laboratory tests are carried out in the form of cat feces examination with native methods and concentration methods. This examination is done to find the presence or absence of an agent and determine the severity of the agent's infection with animals. The results obtained were spirometra eggs with an asymmetrical, ellipsoidal shape, and in one of the poles there was an operculum (Tabel 1). Other laboratory examinations which is complete blood count, show that the cat have leukocytosis, lymphocytosis, eucinophilia, and thrombocytopenia (Table 2).

Table 1. Results of cat feces examination show *Spirometra* eggs


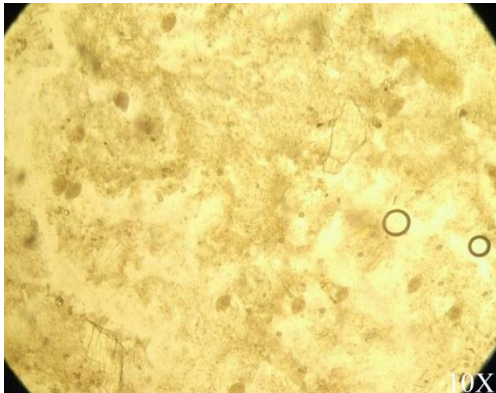
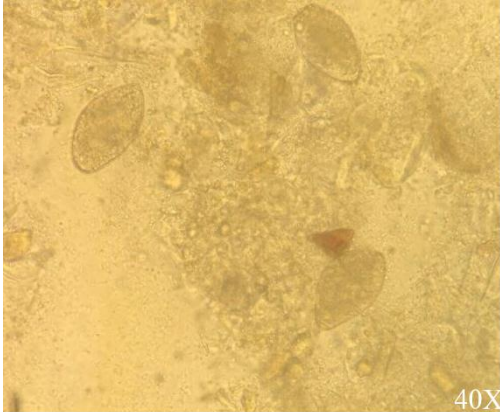
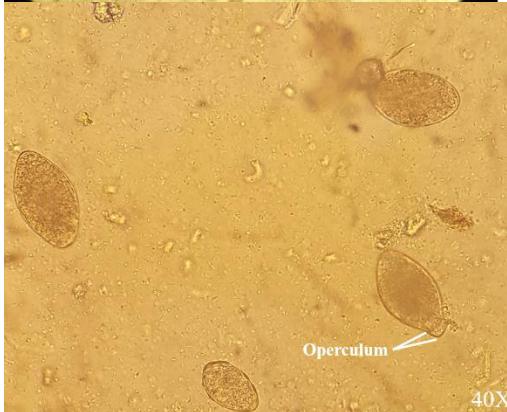
CAT FECES EXAMINATION		
Native Methods	Concentration Methods	
	Sediment	Floating
 10X	 10X	—
 40X	 40X	

Table 2. Results of complete blood count in cats

Hematology	Result	Reference*	Unit	Description
Hemoglobin	10.1	8.00–15.0	g/dL	Normal
Leukocytes	23.3	5.50–19.5	$10^3/\mu\text{L}$	Increase
Erythrocytes	6.88	5.00–10.0	$10^6/\mu\text{L}$	Normal
Hematocrit	28.6	24.0–45.0	%	Normal
MCV (Mean Corpuscular Volume)	41.5	39.0–55.0	FL	Normal
MCH (Mean Corpuscular Hemoglobin)	14.7	12.5–17.5	Pg	Normal
MCHC (Mean Corpuscular Hemoglobin Concentration)	35.5	30.0–36.0	%	Normal
Lymphocytes	10.3	1.50–7.00	$10^9/\text{L}$	Increase
Other	12.0	2.50–13.7	$10^9/\text{L}$	Normal
Eosinophils	1.10	0.00–1.00	$10^9/\text{L}$	Increase
Platelets	2.30	3.00–8.00	$10^5/\mu\text{L}$	Decrease
MPV (Mean Platelets Volume)	6.20	12.0–18.0	fL	Decrease

*Source: Jain (1986)

Treatment

This case animal was treated with Praziquantel (Caniverm® tbl. ad us. vet), 0.5 tablets per 2-5 kg body weight, given twice with a seven-day interval.

DISCUSSION

Sparganum is a parasitic infection caused by *Diphyllobothrium* or *plerocercoid* larvae from the *Spirometra* genus including *S. mansoni*, *S. ranarum*, *S. mansonioides* and *S. erinacei*. The life cycle of *Spirometra* includes pet carnivores and wild animals as definitive hosts, *cyclops* (freshwater *crustaceans*) as the first intermediate host, and fish, reptiles or amphibians, and humans as the second intermediate host. Adult *spirometra* lives in the small intestine of various mammal. Adult worms are usually 60-110 mm length and 5-8 mm wide. Scolex is long and spoon-shaped with two sucker grooves, and a thin and irregular neckline. Adult worms can live up to nine years in the definitive host and produce many *unembryonated* eggs in feces. The eggs are slightly asymmetrical and ellipsoidal ($65 \times 35 \mu\text{m}$), operculum protruding at one of the poles. In cats, eggs can be identified in feces 12 days after infection, up to 70,000 eggs per gram in feces on the day 15th (Lin *et al.*, 2010).

Unembryonated eggs in the water hatch into *coracidia* which are round or oval in shape, with diameter 80-90 μm , and have cilia in the embryonic membrane. *Coracidia* develops into *proceroid* larvae (the first larval stage) after 3-11 days when digested by the first intermediate host (Lee *et al.*, 1990). *Proceroid* larvae are oval (260 μm length and 44-100 μm wide). When

the host *copepod* is swallowed by the second intermediate host, the *proceroid* larvae penetrate the intestinal tract and become *plerocercoids* (sparganum larvae), which then migrate to the subcutaneous tissue and muscles (Kavana *et al.*, 2014). The prepatent period is between 10-30 days in cats, dogs, racoon can be transmitted by *plerocercoid* or adult worms (Margono *et al.*, 2008).

Adult tapeworm *Spirometra* has been reported several times in cats in the United States (Lillis and Burrows, 1964). However, adult worms cause less or no clinical signs at the definitive host (Schmidt *et al.*, 1968). Although sometimes adult worms can be seen clearly in feces and can cause intermittent diarrhea due to mechanical obstruction of small intestine due to worms (Ugarte *et al.*, 2005). Cats can be infected with spargana when the cat consume the *proceroids* larvae so there will be cysts under the skin (Mueller, 1974).

The results of the examination of the case above, the cat was diagnosed positive for sparganosis severe infection but with clinical signs of feces consistency that was soft but still has shape. This was supported by the feces examination with native method and sedimentation and *Spirometra* agents found (Table 1) and the results of the EPG obtained 16,900 shows that the intensity of *spirometra* infection in cats is quite high. According to Anderson and May (1991), *Spirometra spp.* infection commonly occurs in Felidae families with maximum infection intensity of tens of thousands of eggs per gram of feces. In the floating method no eggs were found because of the saturated salt specific gravity 1.210, while the specific gravity egg *spirometra* was 1.459 (Engh *et al.*, 2003).

Other supported laboratory examinations which is complete blood count, show that the cat have leukocytosis, lymphocytosis, eucinophilia, and thrombocytopenia (Table 2). The increased leukocytes are usually followed by an increase in lymphocytes. This can indicate that the animal is in a state of stress or the occurrence of a chronic disease. Eosinophilia can occur due to a parasitic infection or due to an allergen agent. There is an increase of eosinophils as a form of body resistance to parasitic infections. This indicate that in the cat's body contains parasites that is diagnosed with *spirometra*.

This case animal was treated with Praziquantel. Praziquantel is one of the most effective drugs for treating tapeworms in cats. The dose given is according to the recommended dose for kittens and dogs 0.5 tablet per 2–5 kg body weight and 1 tablet for 5-10 kg body weight (Bioveta, 2017). Looking at the cat body weight only 1.4 kg, the cat was given 0.5 tablet and repeated twice with a seven-day interval for each dose. The drug induces vasculolization of the

adhesive around the neck of an adult worm which can eliminate the ability to suck in the gastrointestinal tract.

The evaluation of the cat after twice treatments, for clinical signs of faecal change from grade 3.5 to grade 2 was well formed, did not leave a mark when picked up. According to Linda *et al.* (2014) praziquantel therapy for *Spirometra* worm takes 100 days until the infected animals are truly free from *Spirometra* eggs.

Sparganosis is a food borne zoonotic disease caused by plerocercoid larvae (spargana) from the genus *Spirometra*. Pet animals are one of source of sparganosis in humans and animals. The recommended action for prevention of sparganosis in endemic areas is to avoid the source of infection. Public awareness of this disease will have important implications for clinical signs, diagnosis, treatment, and especially for the cat lovers. Treatment of cestodiasis in definitive host animals can also contribute to sparganosis control in humans and animals.

CONCLUSION

Based on anamnesis, physical examination, and laboratory examination, it was found that the cat were positive infected with *Spirometra* (Sparganosis).

SUGGESTION

In the care of cats, they should be maintained and avoid pet cats from eating feed that can transmit tapeworms to cats.

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