

CASE REPORT: TREATMENT OF GIARDIASIS COMPLICATED BY SEVERE DEHYDRATION IN A DOMESTIC CAT**Laporan Kasus: Penanganan Giardiasis Dengan Komplikasi Dehidrasi Berat pada Kucing Lokal****Bobby Edwin Demetouw^{1*}, Ida Ayu Dian Kusuma Dewi², I Putu Gede Yudhi Arjentina³**¹Student of Veterinary Medicine Professional Education Program, Faculty of Veterinary Medicine, Udayana University, Jl. Sudirman, Sanglah, Denpasar, Bali 80234, Indonesia²Laboratory of Clinical Diagnosis, Clinical Pathology, and Veterinary Radiology, Faculty of Veterinary Medicine, Udayana University, Jl. Sudirman, Sanglah, Denpasar, Bali 80234, Indonesia³Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Jl. Sudirman, Sanglah, Denpasar, Bali 80234, Indonesia

*Corresponding author email: edwinaurora88@gmail.com

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Abstract

Giardiasis is a parasitic disease in cats caused by the protozoan *Giardia* spp., which affects the digestive tract. Clinically, the disease is characterized by lethargy, chronic diarrhea, malabsorption, and a decline in body condition resulting from impaired nutrient absorption. An 8-month-old male local cat was presented to the veterinary clinic in a lethargic state, with a history of recurrent watery diarrhea lasting approximately seven days, accompanied by reduced appetite and weight reduction. Physical examination revealed severe dehydration (estimated at 10%), a capillary refill time (CRT) of >2 s, delayed skin turgor >2 s, dry oral mucosa, and tachycardia. Parasitological fecal examination revealed *Giardia* spp. cysts, and a rapid antigen test confirmed the diagnosis of *giardiasis*. Hematological analysis revealed lymphocytosis, macrocytic hypochromic anemia, and thrombocytopenia. The cat was diagnosed with *giardiasis*, and the prognosis was favorable (fausta). Emergency therapy involved the administration of intravenous Ringer's lactate (30 ml/h) to correct dehydration and stabilize tissue perfusion, followed by metronidazole (20 mg/kg BW, PO, q12h for 7 days), supportive therapy with Guanistrep[®] (kaolin 986 mg, pectin 40 mg), and a dietary switch to gastrointestinal wet food. Evaluation after 72 h showed significant improvement in vital signs and fecal consistency; the cat's clinical condition and vital signs remained stable after 14 days of therapy, and a follow-up direct fecal smear on day 8 showed no *Giardia* spp. cysts.

Keywords: Cat, Diarrhea, *Giardia* spp., Kaolin-pectin, Metronidazole

Abstrak

Giardiasis merupakan penyakit parasiter pada kucing yang disebabkan oleh protozoa *Giardia* spp. yang menyerang saluran pencernaan. Secara klinis, penyakit ini ditandai dengan lemas, diare kronis, malabsorpsi, dan penurunan kondisi tubuh akibat gangguan penyerapan nutrisi dari makanan. Seekor kucing jantan lokal berumur 8 bulan dibawa ke klinik hewan dalam kondisi lemas, dengan riwayat diare cair berulang selama ± 7 hari, disertai penurunan nafsu makan dan berat badan. Pemeriksaan fisik menunjukkan dehidrasi berat sekitar 10% Capillary Refill Time (CRT) > 2 detik, turgor kulit sangat lambat > 2 detik, mukosa mulut kering, dan takikardia. Pemeriksaan feses secara parasitologi menunjukkan kista *Giardia* spp., dan uji cepat (rapid test antigen) menunjukkan hasil positif Giardiasis. Pemeriksaan hematologi memperlihatkan limfositosis, anemia makrositik hipokromik, serta trombositopenia. Diagnosis kucing mengalami Giardiasis dengan prognosis fausta. Terapi darurat dilakukan melalui pemberian cairan intravena ringer lactate 30 ml/jam untuk mengatasi dehidrasi dan menstabilkan perfusi jaringan, diikuti pemberian metronidazole (20 mg/kg BB, PO, q12h selama 7 hari), terapi suportif Guanistrep[®] (kaolin 986 mg, pectin 40 mg), serta pergantian pakan ke wet food gastrointestinal. Evaluasi dalam 72 jam menunjukkan perbaikan signifikan pada tanda vital dan konsistensi feses, dengan kondisi klinis serta vital kucing yang stabil setelah 14 hari terapi dengan dilakukannya natif feses pada hari ke 8 yang tidak ditemukannya kista *Giardia* spp.

Keywords: Kucing, Diare, *Giardia* spp., Kaolin-pectin, Metronidazole

INTRODUCTION

Giardiasis is a common parasitic disease in cats caused by the protozoan *Giardia* spp., which infects the digestive tract, particularly the small intestine. This infection impairs nutrient absorption and can lead to clinical symptoms such as chronic diarrhea, malabsorption, and decline in overall health. A distinctive feature of this disease is that its symptoms can be intermittent, making diagnosis challenging. According to Fujishiro *et al.* (2020), giardiasis is a leading cause of chronic diarrhea in young cats and cats with weakened immune systems. Diarrhea caused by giardiasis can range from intermittent to persistent, with stool consistency ranging from soft to watery, a strong odor, and sometimes containing mucus. Prolonged fluid and electrolyte loss can lead to severe dehydration and metabolic acidosis, which are medical emergencies and can be life-threatening if not treated promptly (Bowman & Lucio-Forster, 2010).

Giardia spp. transmission occurs via the fecal-oral route, through the ingestion of infectious cysts originating from the feces of infected animals or a contaminated environment (Fujishiro *et al.*, 2020). Transmission sources include drinking water, feed, and feeding utensils contaminated with cysts. According to Yaoyu *et al.* (2011), cats can serve as potential reservoirs for the zoonotic *Giardia duodenalis* assemblages A and B, indicating that this infection has implications for both animals and humans. Risk factors that increase the likelihood of infection include poor environmental sanitation, high animal population density, compromised immune status, and low adherence to preventive measures, such as environmental hygiene management and routine parasite control (Fujishiro *et al.*, 2020). Clinically, giardiasis can be subclinical or can cause diarrhea of varying severity, depending on the level of infection and host immune response (Tangtrongsup & Scorza, 2010). Damage to intestinal microvilli caused by the adhesion of *Giardia* trophozoites (the process by which trophozoites attach to the intestinal mucosa) leads to malabsorption of fats, carbohydrates, vitamin B12, and iron, thereby worsening the patient's condition (Tangtrongsup & Scorza, 2010). This condition can progress to severe dehydration and electrolyte imbalance, making it

a clinical emergency that requires prompt and appropriate treatment (Ballweber *et al.*, 2010). In Indonesia, the prevalence of gastrointestinal protozoan infections in local cats in Denpasar was reported to be 31.3%, with a prevalence of 22.5% in pet cats and 40% in feral cats, indicating that gastrointestinal protozoan infections remain a significant problem in veterinary practice (Akbari *et al.*, 2018; Sucitrayani *et al.*, 2014).

This case is important because it demonstrates that giardiasis can progress to a medical emergency due to severe dehydration and requires immediate treatment. Furthermore, this case illustrates the diagnostic challenges posed by the intermittent excretion of *Giardia* cysts, as well as the successful management leading to clinical improvement in the patient's condition. This case report describes the diagnostic process, prognosis, and management of giardiasis with severe dehydration complications in cats and emphasizes the importance of rapid intervention in emergency situations and the implementation of preventive measures to reduce the risk of disease transmission in animal-care settings.

RESEARCH METHODS

Clinical Presentation and Medical History

A 2.6 kg male domestic cat, aged 2.6 kg, with an orange coat patterned with white, who had not yet been vaccinated, neutered, or treated for intestinal worms was presented to our clinic. Based on the medical history, the cat was lethargic and had acute diarrhea lasting approximately 7 days, accompanied by anorexia, lethargy, and weight loss. The feces were watery and paler than normal. The cat was kept outdoors with two other cats that exhibited similar clinical signs. The cat was fed chicken heads and had ad libitum access to tap water. Outdoor living conditions and contact with other animals are suspected to have played a role in the transmission of gastrointestinal infectious agents, which could potentially cause digestive disorders in cats.

Physical Examination

A physical examination of the cat was performed on August 18, 2025, to obtain data to support the diagnosis. The results of the current status examination revealed abnormalities in all parameters, including tachycardia and hypothermia (Table 1). The cat appeared extremely lethargic and had minimal motor response to stimuli. Abdominal examination revealed palpable, tense, and distended intestines. Signs of dehydration, such as slow skin turgor, dry oral mucous membranes, and prolonged capillary refill time (CRT), were observed, indicating approximately 10% dehydration (Payne & Artzer, 2009).

Supportive Tests

Parasitology (Native). The test was performed by collecting a sample via an anal swab, which was then smeared onto a microscope slide with the addition of physiological NaCl solution. The specimen was examined under a light microscope, and at 400x magnification, structures resembling *Giardia* cysts were observed, characterized by oval, thick-walled, nucleated, and non-motile cysts (Figure 1).

(CBC) Complete Blood Count. A complete blood count was performed to assess the systemic condition of the cat. The results showed leukocytosis accompanied by lymphocytosis, indicating an active immune response to protozoan infection (Table 2). Additionally, hypochromic macrocytic anemia was observed, suggesting a nutrient absorption disorder due to damage to the small intestinal mucosa. The cat also exhibited thrombocytopenia, which is likely related to chronic inflammatory processes or microhemorrhages in the gastrointestinal tract.

Rapid Test Kit. The rapid test kit used included parameters for (GIA) giardiasis, (FCoV) feline coronavirus, and (FPV) feline panleukopenia virus. In the giardiasis (GIA) section, two lines (C and T) were visible, indicating a positive result for giardiasis. Meanwhile, in the feline coronavirus (FCoV) and feline coronavirus and (FPV) sections, only one line appeared in the control (C) area, with no line in the test (T) area; therefore, the results were negative for both infections (Figure 2).

Diagnosis and Prognosis

Based on the medical history, physical examination, and results of ancillary tests, the cat was diagnosed with giardiasis caused by *Giardia* spp. Differential diagnoses, such as feline panleukopenia virus (FPV) and feline coronavirus (FCoV), were ruled out based on the negative rapid test results for both agents. Hematology test results showed leukocytosis with lymphocytosis, indicating an immune response to the protozoal infection, as well as hypochromic macrocytic anemia, which is suspected to result from malabsorption of iron and vitamin B12 secondary to damage to the small intestinal mucosa by *Giardia* spp. trophozoites. Chronic inflammation may also contribute to thrombocytopenia. Based on the clinical findings and good response to treatment, the prognosis for this patient was considered favorable.

Management

The initial management focused on emergency conditions resulting from severe dehydration. The cat exhibited prolonged capillary refill time (CRT), very slow skin turgor, dry oral mucosa, and tachycardia, indicating approximately 10% dehydration. Intravenous fluid therapy using Ringer's lactate was administered at a rate of 30 mL/h for 2 days (Bowman & Lucio-Forster, 2010) to restore circulating volume, stabilize blood pressure, and improve tissue perfusion.

After the cat's condition stabilized on the second day, treatment continued with causative therapy for gastrointestinal disorders. The antibiotic metronidazole was administered at a dose of 20 mg/kg body weight orally every 12 h for 7 days (Metronidazole 500 mg; PT. Sejahtera Lestari Farma, Pasuruan, Indonesia). Supportive therapy consisted of the adsorbent antidiarrheal agent Guanistrep[®] (kaolin 986 mg, pectin 40 mg; Itrasal, Semarang, Indonesia), administered at a dose of 10 mg/kg body weight orally every 24 h for 7 days. In addition, the cat's diet was switched to gastrointestinal wet food (Nature Bridge[®], Veterinary Exclusive, Shanghai, China) for 7 days. The cat was also kept in a cage to facilitate the monitoring of its general condition and defecation patterns.

RESULTS AND DISCUSSION

Results

Observations were conducted for 14 days after treatment. Six hours after the first treatment, the cat showed slight improvement, as evidenced by normal pretreatment values for several parameters. The cat responded to physical stimuli. Twelve hours after treatment, the cat was able to stand, eat, and drink normally, and the skin turgor returned to normal. Between 24 and 48 h after treatment, the values of nearly all parameters returned to normal. By 72 h after treatment, the cat was in a stable condition, and by the 14th day of therapy (Table 3), the stool was normal. A stool examination performed on the 8th day revealed no *Giardia* spp. cysts.

The 7-day course of medication yielded positive results, and the patient's condition steadily improved. A follow-up native stool examination on the 8th day post-treatment was negative for *Giardia* spp. cysts. Microscopic examination revealed no *Giardia* spp. cysts; only fecal debris and other non-specific particles were observed. These results indicate that the causative agent of giardiasis was successfully eliminated from the gastrointestinal tract. Follow-up monitoring was continued until day 14 to ensure that there was no reinfection or recurrence.

During this period, the cat's clinical condition remained stable with normal stool consistency, and no signs of diarrhea were observed, confirming the success of treatment.

Discussion

This case of giardiasis in a cat exhibited characteristic clinical manifestations, including acute diarrhea that may progress to chronic diarrhea, as evidenced by a week-long history of weight loss, generalized weakness, and severe dehydration. Clinically, *Giardia* spp. infection often causes intermittent to persistent diarrhea with soft to watery stool consistency, accompanied by mucus and a paler stool color (Tangtrongsup & Scorza, 2010). These conditions arise from impaired absorption of nutrients and fluids in the small intestine caused by *Giardia* trophozoites adhering to the intestinal mucosa and damaging the microvilli. This mechanism leads to malabsorption of fats, vitamin B12, and iron, as well as increased secretion of luminal fluid, resulting in diarrhea and a decline in overall health (Fujishiro *et al.*, 2020).

The results of hematological testing in cats support the pathophysiological mechanism of acute giardiasis. *Giardia* spp. trophozoites adhere to the small intestinal mucosa and damage the microvilli, causing intestinal villus atrophy and disruption of brush border enzyme functions. These conditions result in fluid and electrolyte malabsorption and increased mucosal secretion, triggering acute watery diarrhea, which leads to rapid dehydration. Leukocytosis and lymphocytosis indicate the activation of an immune response to protozoal infection, as reported by Gruffydd-Jones *et al.* (2013), who noted that *Giardia* triggers an inflammatory response in the intestinal mucosa. Thrombocytopenia is likely related to a systemic inflammatory process or increased platelet consumption during the inflammatory response (Ballweber *et al.*, 2010).

Severe dehydration identified during the physical examination classified this case as a clinical emergency. Fluid and electrolyte loss due to acute diarrhea causes hypovolemia, which can progress to decompensated shock, characterized by relative bradycardia, reduced tissue perfusion, and metabolic acidosis, if not promptly corrected (Ballweber *et al.*, 2010). Therefore, management began with intravenous administration of Ringer's lactate solution to restore circulating volume, improve tissue perfusion, and help correct metabolic acidosis through the metabolism of lactate into bicarbonate in the liver. Once the cat's condition was stable, causative therapy was initiated using metronidazole (20 mg/kg body weight, PO, every 12 h for 7 d) as the primary antiprotozoal agent. Metronidazole works by damaging the DNA structure of protozoa, thereby inhibiting nucleic acid synthesis and causing *Giardia* spp. death. It has been reported to be effective in treating giardiasis in cats (Barr *et al.*, 1994).

In addition, supportive therapy was administered in the form of kaolin-pectin as an adsorbent to reduce toxins in the intestinal lumen and protect the gastrointestinal mucosa, as well as a special gastrointestinal wet food diet to improve the condition of the intestinal mucosa and support the recovery of the digestive system. After 72 h of this combination therapy, the cat's condition showed significant clinical improvement, consistent with the report by Tangtrongsup & Scorza (2010), who reported that rapid clinical recovery can be achieved if antiparasitic and supportive therapies are administered early on.

The success of the treatment in this case was further confirmed by the results of a follow-up native stool examination on the 8th day after treatment, which showed no *Giardia* spp. cysts. These findings indicate that metronidazole exerts an antiprotozoal effect by damaging the DNA of *Giardia* spp., thereby inhibiting replication and causing the death of the parasite. However, native stool examination has limitations because the excretion of *Giardia* spp. cysts is intermittent; therefore, the absence of cysts in a single examination cannot be used as a definitive indicator of cure. Consequently, treatment success must be confirmed by complete

clinical resolution, characterized by a return to normal stool consistency and the absence of clinical symptoms for several consecutive days after the treatment.

Follow-up monitoring on day 14 showed no clinical recurrence or reinfection, as indicated by normal stool consistency and a stable general condition of the cat. This suggests that, in addition to being causally effective, the administered therapy supported the recovery of the intestinal mucosa. The success of therapy in cases of giardiasis is assessed not only based on stool test results but also through clinical resolution, as indicated by consistently normal stool consistency and the absence of any recurrence of clinical symptoms during the observation period.

Although the results of parasitological examination and rapid testing confirmed the presence of *Giardia* spp., diagnostic limitations should be considered. Antigen testing using ELISA or molecular detection via PCR was not performed. Both methods have higher sensitivity and specificity than microscopic examination, thereby improving diagnostic accuracy, particularly in cases of intermittent cyst shedding (Payne & Artzer, 2009). Therefore, the interpretation of test results must be considered in conjunction with the clinical manifestations and supporting laboratory findings.

In addition to its clinical aspects, giardiasis has significant public health implications because some *Giardia duodenalis* assemblages, particularly assemblages A and B, are zoonotic and can infect humans, whereas assemblage F is more commonly found in cats (Yaoyu & Xiao, 2011). *Giardia* cysts are highly resistant to moist environments and can remain infectious for a considerable period of time. In addition to being transmitted through food or water contaminated with feces, cysts can also attach to a cat's fur, particularly in the perineal region, potentially spreading mechanically when the cat grooms itself or through contact with humans or other animals. Given that *Giardia* has a very low infectious dose, ingesting even a small number of cysts can cause infection. Therefore, educating owners about cage hygiene, routine cleaning and disposal of feces, bathing cats after treatment to remove cysts attached to their fur, washing hands after handling animals, and maintaining the cleanliness of drinking water sources are important steps to prevent reinfection and transmission to animals and humans.

Overall, the clinical and hematological findings and response to treatment in this case are consistent with those reported in the literature. This case underscores that acute giardiasis can progress to a medical emergency due to severe dehydration; therefore, successful management depends heavily on early diagnosis, rapid fluid resuscitation, appropriate antiprotozoal therapy, and implementation of biosecurity measures and owner education to prevent reinfection and the spread of the disease.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on clinical manifestations, hematological tests, and confirmation via native testing and rapid test kits, the patient was diagnosed with acute enteritis caused by *Giardia* spp. infection, complicated by severe dehydration (~10%) and decompensated hypovolemic shock. Emergency management through aggressive intravenous fluid resuscitation using Ringer's lactate in the early phase proved crucial for stabilizing the patient's hemodynamics prior to initiating causative therapy. Combination therapy using metronidazole, kaolin-pectin adsorbent, and a specialized gastrointestinal diet was highly effective in completely eliminating the parasite, as confirmed by a negative repeat stool test on day 8 after treatment initiation. This combination therapy resulted in significant clinical recovery within 72 h and full stability by day 14, without relapse. This case underscores that the successful management of giardiasis

with critical complications relies on the speed of emergency fluid intervention, accurate early diagnosis, and educating the owner regarding environmental sanitation to prevent reinfection and potential zoonotic transmissions.

Suggestions

Follow-up testing using antigen ELISA or PCR is recommended to confirm the diagnosis and identify the specific *Giardia* assemblage. In addition, pet owners should be educated on the importance of environmental sanitation, prevention of drinking water contamination, and temporary isolation of infected animals to reduce the risk of transmission between animals and the potential for zoonosis.

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Tables

Table 1. General physical examination findings

Parameter	Finding	Reference Range*	Remark
Heart rate (beats/min)	112	140–220	↓
Pulse rate (beats/min)	112	140–220	↓
CRT (seconds)	>2	<2	↑
Respiratory rate (breaths/min)	20	24–42	↓
Body temperature (°C)	36.8	38.1–39.2	↓
Skin turgor	Markedly delayed	Prompt	↓

Note: CRT: Capillary Refill Time; * Tilley *et al.* (2021); ↓: decreased; ↑: increased.

Table 2. Complete blood count result

Parameter	Value	Unit	Normal value*
WBC	34.79 (↑)	10 ³ /μL	5.50-19.50
Lym#	16.66 (↑)	10 ³ /μL	0.8-7
Mid#	3.38 (↑)	10 ³ /μL	0-1.9
Gra#	14.75	10 ³ /μL	2.1-15
Lym%	47.9 (↑)	%	12-45
Mid%	9.7 (↑)	%	2-9
Gra%	42.4	%	12-45
RBC	3.96 (↓)	10 ⁶ /μL	4.6-10
HGB	7.2 (↓)	g/dL	9.3-15.3
MCHC	29.8 (↓)	g/dL	30-38
MCH	18.1	pg	13-21
MCV	60.7 (↑)	fL	39-52
RDWCV	13.4 (↓)	%	11-15.5
RDWSD	38.4	fL	35-56
HCT	24 (↓)	%	28-49
PLT	60 (↓)	10 ³ /μL	100-514
MPV	7.3	fL	5-11.8
PDW	19.9 (↑)	fL	10-18
PCT	0.044 (↓)	%	0.1-0.5
P-LCR	15.1	%	13-43

Note: Increased (↑); Decreased (↓). WBC: White Blood Cell; Lym: Lymphocyte; Mon: Monocytes; Neu: Neutrophile; Eos: Eosinophile; Bas: Basophils; RBC: Red Blood Cell; HGB: Hemoglobin; MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin Concentration; RDWCV: Red Cell Distribution Width Coefficient Variation, RDWSD: Red Cell Distribution Width Standard Deviation; HCT: Hematocrit; PLT: Platelet; MPV: Mean Platelet Volume; PDW: Platelet Distribution Width; PCT: Plateletcrit. *) References: automatic hematology analyzer (Genvet® VH30)

Table 3. Physical examination findings before and at 6, 12, 24, 48, and 72 hours post-treatment

Parameter	Pre-treatment	6 h	12 h	24 h	48 h	72 h	Reference Range*
Heart rate (beats/min)	110	115 (↓)	118 (↓)	126 (↓)	138 (↓)	145	140–220
Pulse rate (beats/min)	110 (↓)	115 (↓)	118 (↓)	124 (↓)	135 (↓)	141	140–220
CRT (seconds)	>2 (↑)	>2 (↑)	>2 (↑)	<2 (↑)	>2 (↑)	>2	<2
Respiratory rate (breaths/min)	21 (↓)	22 (↓)	22 (↓)	24	24	30	24–42
Body temperature (°C)	36.3 (↓)	36.5 (↓)	37.4 (↓)	38 (↓)	38.1	38.5	38.1–39.2
Skin turgor	Markedly delayed	Markedly delayed	Delayed	Delayed	Prompt	Prompt	Prompt

Note: CRT: Capillary Refill Time; * Tilley *et al.* (2021); (↓) = decreased; (↑) = increased.

Figures

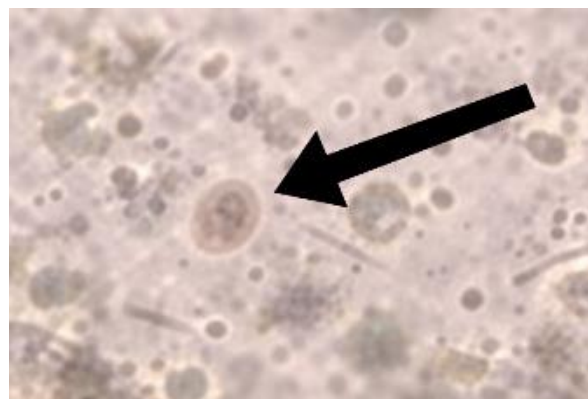


Figure 1. Direct fecal wet mount examination revealing a *Giardia* cyst (black arrow, 400× magnification).

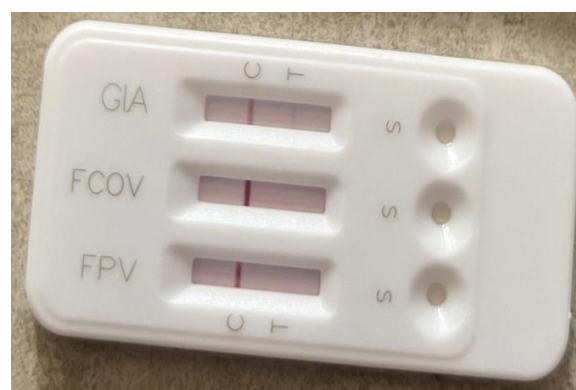


Figure 2. Rapid diagnostic test kit results showing positive (+) for giardiasis (GIA), negative (-) for feline coronavirus (FCoV), and negative (-) for feline panleukopenia virus (FPV).