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Feline trypanosomosis in a free-ranging domestic shorthair cat (*Felis catus*)

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Abstract

A free-ranging domestic shorthair cat named Lily was brought to the clinic with signs of alopecia, pyrexia, inappetence, incoordination, loss of condition, conjunctivitis, and chemosis. A history of multiple diagnostic tests and treatment protocols from various clinics was presented. The FNAC of facial swelling revealed an incidental finding of *Trypanosoma* spp. infection. PCR revealed *Trypanosoma evansi* infection. The treatment protocol included diminazene aceturate at the dose rate of 3.5 mg/kg, deep i/m, one dose weekly for four doses, with supportive therapies, both enteral and parenteral. Decubital ulcers formed during the course of treatment due to inactivity and cage rest and were treated separately via topical ointment. No *Trypanosoma* spp. were identified in the peripheral blood smear after completion of the course of diminazene aceturate. The cat recovered entirely within one month after completion of the aforementioned treatment.

Keywords: *Trypanosoma evansi*, Trypanosomosis in India, diminazene aceturate, alopecia, incoordination, feline trypanosomosis

1. Introduction

Hematophagous vectors such as Stomoxys, Tabanus, and Triatomine bugs are the primary transmitters of trypanosomosis. Recent evidence also suggests transmission via the ingestion of carcasses from recently infected animals, broadening the understanding of potential infection routes [4, 11, 13, 17]. Trypanosoma infections are widespread, ranging from Africa and Asia to the Americas [17].

Clinical manifestations range from acute febrile episodes, hyperthermia, anorexia, anaemia, and lethargy to chronic wasting, lymphadenopathy, and neurological signs such as encephalitis, seizures, and ataxia [1, 3, 12, 15, 16].

Peripheral blood smears from the ear vein are used to identify blood parasites such as *Trypanosoma* spp. [3]. Diagnosis is confirmed via microscopic detection of trypanosomes in Giemsa-stained thick and thin blood smears, PCR, ELISA, immunofluorescent tests, or cerebrospinal fluid (CSF) analysis for patients with central nervous system involvement [3, 17]. Molecular and immunological diagnostic techniques are generally used to identify the causative species in an infection [5, 6, 9, 10].

Treatment involves the administration of trypanocides (or chemotherapeutic drugs), such as dimidium bromide, potassium antimony tartrate, suramin, melarsamine, quinapyramine, homidium, diminazene aceturate, and isometamidium, of which the latter six may also be used as prophylactic drugs [2, 7, 17]. Prophylactic drugs and chemotherapeutic drugs have no fundamental difference, except that the ones used in chemoprophylaxis show a longer curative concentration in the body (three months) than the rest [17, 99-101]. Resistance to homidium is prevalent [17, 99-101].

The subcutaneous route of injection may cause skin necrosis and pain due to local irritation, the intravenous route may cause necrosis of vessel walls, often causing fatality, whereas the intramuscular route causes no such damage and significantly less pain [17, pp. 90-94]. Vaccination attempts against trypanosomosis have failed, making vector control and chemoprophylaxis the only reliable preventative measures [17, 99-125].

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The incidence of naturally occurring trypanosomosis in felines has rarely been reported in the scientific literature, primarily because cats are relatively more resistant than other vertebrate hosts are. As a result, trypanosomosis is rarely observed and diagnosed in felids, rendering it an uncommon parasitic infection within this species [8]. Feline trypanosomosis in domestic cats has been reported in one case in India [14], one case in Canada [8], three cases in Kuwait [15], and seven cases in Iraq [9]. The infections were caused by *Trypanosoma brucei* and *Trypanosoma evansi* [4, 8, 9, 14, 15], both of which elicit the same clinical symptoms in cats, which

are directly proportional to parasitaemia.

2. Patient Information: An adult (~6 years old), female, free-ranging domestic short hair came in with the complaint of alopecia several weeks after spay surgery, limping, loss of condition, and polydipsia. She was referred to multiple clinics where various tests and treatments were carried out before she came in for an appointment at our clinic.

2.1 History

2.1.1 Diagnostic History

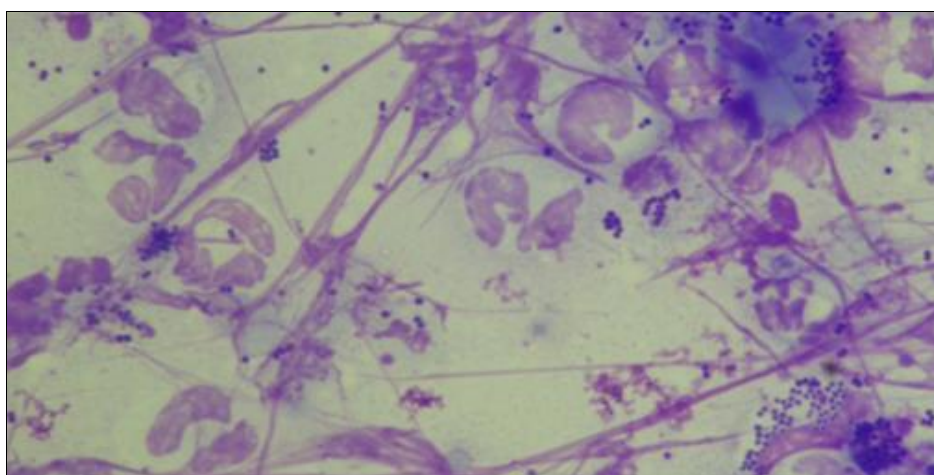
Date	Test(s)	Remarks
29-06-2024	CBC, LFT, KFT	↓Plt., ↓Creat., ↓Urea, ↓AST
06-07-2024	Hair sample for fungal culture	No growth
16-07-2024	Eye smear	Cocci; neutrophils
16-07-2024	Skin smear	Erythrocytes; neutrophils
22-07-2024	CBC, LFT, KFT	↓Lymphocytes, ↓Plt., ↓Creat., ↓Urea, ↓ALP, ↑Glb.
24-07-2024	Feline protozoa panel	Negative for <i>Babesia</i> spp., <i>Babesia felis</i> , <i>Bartonella</i> spp., <i>Mycoplasma</i> spp., and <i>Cytauxzoon</i> spp.
24-07-2024	Feline viral panel	Negative for feline immunodeficiency virus, feline panleucopenia virus, and feline leukemia virus.

2.1.2 Treatment History

Date	Treatments
05-06-2024	Doxycycline (7 days); Himpyrin (Himalaya wellness company, India); Selamectin (topical usage); Meloxicam; Pheniramine malate (Tab. Avil); Ceftriaxone; Prednisolone (course incomplete)
29-06-2024	Selamec (topical usage); Hydroxyzine Hydrochloride (Tab. Atarax); Amoxicillin (Moxikid)
06-07-2024	Prednisolone (Tab. Wysolone); Mupirocin (Oint. Staphban), (Previous Rx extended)
16-07-2024	Gatifloxacin eye drops, Selamec (Previous Rx extended)
22-07-2024	Doxycycline

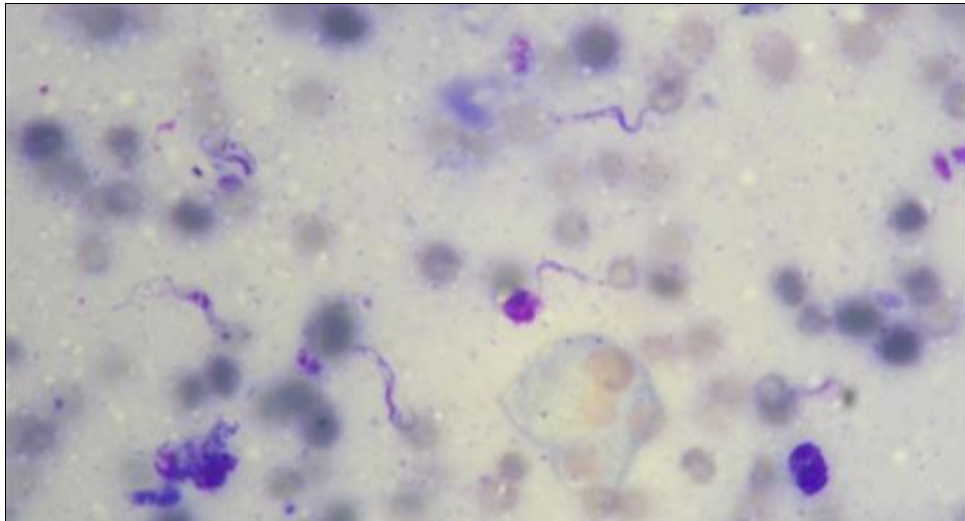
3. Case Discussion

Date	Presentation/Diagnostic Test(s)	Treatment/Comments/Results
29-07-2024	Initial checkup and treatment	Limping, weight loss, polydipsia, alopecia, conjunctivitis, chemosis and wounds on the right forelimb, temp.:102.9°F, MM: Pale pink
	Abdominopelvic Ultrasonography	Oint. Interban Maxima (povidone iodine, metronidazole, and sucralfate) for the wound. Case studied for one day. Bilaterally enlarged median iliac lymph nodes, and moderately enlarged jejunal lymph nodes with normal echotexture
30-07-2024	Follow up, CBC and blood smear examination, symptomatic treatment	Regenerative leftward shift in leucocytes, no clumping of platelets, ↓Plt., ↑Neutrophils, ↑Leucocytes
		Doxycycline (10 mg/kg for 4 weeks), Gabapentin (50 mg nightly for 10 days), FeFolate syrup (1 ml daily for a month), and Carboxymethyl Cellulose eyedrops (10 days).
01-08-2024	Follow up and symptomatic treatment	Incoordination, increased periocular and ocular swelling, and pyrexia at 103.8°F.
		Avil (pheniramine malate) and Belamyl (Vitamin B complex, liver extract, Vitamin B12) parenterally, and Setwell (herbal analgesic, antipyretic, and anti-inflammatory) syrup orally.
	Ocular smear	Degenerate neutrophils and macrophages (Figure 1)
03-08-2024	FNAC of periocular swelling	<i>Trypanosoma</i> amastigotes (Figure 2)
	Lateral and DV X-rays	NAD
03-08-2024	RT-PCR	<i>Trypanosoma evansi</i> detected (CT value: 28.1 – moderate infection)



Tested at VetProDx-Veterinary Diagnostics LLP (By Dr. Shivam S. Mandhare)

Fig 1: Ocular smear showing many degenerate neutrophils with phagocytosed cocci



Tested at VetProDx-Veterinary Diagnostics LLP (By Dr. Shivam S. Mandhare)

Fig 2: FNAC showing *Trypanosoma* spp. amastigotes

4. Treatment

The treatment plan included administration of Diminazene Aceturate (Berenil® Vet 7% RTU) at the dose rate of 3.5 mg/kg deep i/m once a week for 4 weeks, along with buprenorphine (Bupren) at a dose rate of 0.02 mg/kg and fluids (DNS and RL) at 30 ml/kg body weight. The course of doxycycline prescribed on 29/07/2024 continued to be completed.

The first dose was administered on 03/08/2024, after which her appetite increased and her hair began growing at the site of alopecia. No adverse reactions were noted. Decubitus ulcers were found at the hock joints bilaterally due to her plantigrade posture, caused by a lack of muscle tone and overall body strength. An increase in incoordination was

noted due to a further reduction in muscle mass, presumably due to immobility caused by her being fostered under a facility where she was kept in a cage. Syrup SAME-Liv (S-adenosylmethionine and Silybin A+B) was prescribed at 1.5 ml twice a day for 30 days. The second, third and fourth doses were administered on 09/08/2024, 16/08/2024 and 22/08/2024, respectively. Ointment Scavon (Himalaya) was prescribed for the decubitus ulcers. Ondansetron at 0.2 mg/kg was administered intravenously to avoid nausea caused by travel to and from the clinic.

Blood tests performed on 12/08/2024 revealed mild infection and inflammation, among other non-appreciable findings.

A peripheral blood smear done on 22/08/2024 revealed no presence of parasites.



Fig 3: Lily's progress throughout the treatment - At first consultation, prior to Trypanosomosis diagnosis (a, b), post two doses of diaminazene acetate (c), two weeks post fourth dose of diaminazene acetate (d)

Item	Result	Reference
WBC	16.16 $10^3/\mu\text{L}$	5-18.5 $10^3/\mu\text{L}$
LYM#	7.12 $10^3/\mu\text{L}$	0.8-7 $10^3/\mu\text{L}$
MID#	1.35 $10^3/\mu\text{L}$	0.1-1.9 $10^3/\mu\text{L}$
GRA#	7.69 $10^3/\mu\text{L}$	2.1-15 $10^3/\mu\text{L}$
LYM%	44.1 %	12-45 %
MID%	8.4 %	2-9 %
GRA%	47.5 %	35-85 %
RBC	6.94 $10^6/\mu\text{L}$	4.3-9.2 $10^6/\mu\text{L}$
HGB	12.6 g/dL	8-15 g/dL
MCHC	38.0 g/dL	30-38 g/dL
MCH	18.1 pg	12-21 pg
MCV	47.7 fL	37-61 fL
RDW-CV	19.0 %	14-18 %
RDW-SD	25.5 fL	35-56 fL
HCT	33.1 %	24-45 %
PLT	311 $10^3/\mu\text{L}$	175-500 $10^3/\mu\text{L}$
MPV	11.6 fL	5-11.8 fL
PDW	11.1 fL	10-18 fL
PCT	0.36 %	0.1-0.5 %
P-LCC	62.20 %	13-43 %
P-LCC	193 $10^3/\mu\text{L}$	0-0 $10^3/\mu\text{L}$

Tested at Critter Care Veterinary Clinic, Mahim

Fig 4: Complete blood count-24/10/2024

5. Discussion and Conclusion

Lily had severe conjunctivitis, chemosis, alopecia, muscle wasting and incoordination before treatment (Figure 3 a, b). She was diagnosed with *Trypanosoma evansi* infection via FNAC and PCR. The treatment plan included the use of diminazene aceturate (Berenil® Vet 7% RTU) ^[2, 7, 17] at a dosage of 3.5 mg/kg deep i/m ^[17] once a week for four weeks. Supplemental syrups and tonics were prescribed simultaneously. After two sessions of treatment, her appetite increased, and the patches of alopecia started showing new hair growth (Figure 3 c). Conjunctivitis and chemosis, along with the bilateral periocular oedema, were significantly reduced. Two weeks after the final dose, the decubital ulcers that formed due to cage rest and the plantigrade posture had healed, and her clinical signs disappeared (Figure 3 d). A complete blood panel was run on 24/10/2024 (Figure 4), which revealed all values to be within the normal range. The cat was released into her surroundings since she was anxious about being indoors.

Conflict of Interest

Not available

Financial Support

Not available

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