CASE REPORT

# First Case of Dirofilariasis in a Dog From Goa, India

Nikita Sunil Das[1], Prashant Dhanaji Pawar[1*], Prashant Patilba Mhase[1], Vrushali Namdev Sarawade[1], Vitthal Shrirang Dhaygude[1], Hemant Kumar[1], Lachhman Das Singla[2]

*Ind J Vet Sci and Biotech* (2021): 10.21887/ijvsbt.17.2.22

[1]Department of Veterinary Parasitology, College of Veterinary Sciences Shirwal- 412801, Maharashtra.

[2]Department of Veterinary Parasitology, Guru AngadDev Veterinary and Animal Sciences University, Ludhiana-141004, Punjab, India

**Corresponding Author:** Dr. P. D. Pawar, Department of Veterinary Parasitology, College of Veterinary Sciences, Shirwal- 412801, e-mail: prashant_vet@yahoo.co.in

**How to cite this article:** Das, N., Pawar, P.D., Mhase, P.P., Sarawade, V., Dhaygude, V.S., Kumar, H., & Singla, L.D. (2021). First Case of Dirofilariasis in a Dog From Goa, India. Ind J Vet Sci and Biotech, 17(2): 105-107.

**Source of support:** Nil

**Conflict of interest:** None.

**Submitted:** 10/01/2021 **Accepted:** 20/05/2021 **Published:** 25/06/2021

Dirofilariosis caused by a filaroid nematode *Dirofilaria immitis* is a severe disease condition in canines transmitted through mosquitoes and flea bites (Borthakur *et al*., 2015). It is a severe health risk to canines as even light infections can produce pulmonary vascular and parenchymal disease (Montoya-Alonso *et al*., 2010; Simon *et al*., 2012). Severe cases result in thrombo-embolism following the natural death. The dog may show hemoptysis, a sign of an acute life-threatening condition. Laboratory diagnosis of dirofilariasis in live animals is always made based on the presence of microfilariae in the tested blood sample. There have been both clinical as well as epidemiological studies worldwide, and the prevalence of this parasite in dogs has also been reported from India (Borthakur *et al.,* 2015). Even occurrence of other species like *D.repens* has been reported from India (Ananda *et al.,* 2006). Some other species like *Acanthochelionema reconditium, A. dracunculoides, Brugia malayi* are reported from other countries. Heartworm disease due to *D. immitis* has been reported as an emerging zoonosis (Reddy 2013). An asymptomatic parasitemia in human beings is demonstrated in radiography studies. More than 1,700 human cases of dirofilariasis have been documented worldwide, suggesting that wherever canine dirofilariasis is present, humans are at risk of infection (Montoya-Alonso *et al*., 2010; Simon *et al*., 2012). As early as the year 1989, the first case of dirofilariasis in India was reported by Badhe and Sane (1989) from Mumbai. After that, several cases have been reported from India (Dam and Das, 2006; MegatAbd Rani *et al.,* 2010; Joseph *et al.,* 2011; ). Recently a study on dirofilariasis as an emerging zoonosis has been published from Southern India (Joy *et al.,* 2017). However, there are no reports of the occurrence of *D. immitis* infection in the canine population from Goa, and therefore, considering the importance of this disease in canines and human beings, the present case report was placed on record from Goa, India.

## Case History and Clinical Observation

A six-year-old non-descript female dog suffering from two weeks was presented to a private clinic in Porvorim, Goa, India, with a history of high fever (104°F), inappetence, persistent cough for since last one week and vomition during the last 2-3 days. The dog was debilitated and had lost seven to eight kilograms of body weight within 15 days. A thorough clinical examination was performed, revealing severe dehydration and tachycardia. Blood was collected aseptically from the cephalic vein in two vials in disodium salt of ethylene-diamine-tetraacetic acid ($Na_2$EDTA) @ 2 mg/ml, preserved in refrigerator, and was processed for complete hematological analysis. A single drop of blood was taken on the slide, and wet film was prepared and observed immediately under a low-power compound microscope (10x) for the presence of extracellular parasites. For further identification and confirmation of organism up to genus/species level, a thin blood smear was processed for morphometric studies by Romanowsy staining and with Knott's method for detection of Dirofilaria (Watanabe *et al*., 2004; Gupta and Singla 2012). The hematological estimations on blood samples were performed using an automated hematology analyzer.

The wet blood smear examination revealed the presence of motile extracellular microfilariae with characteristic motility. Knott's concentration technique revealed numerous methylene blue-stained microfilariae in the background with dark blue-stained nuclei. The morphology of microfilariae under a microscope showed a blunt head along with tapering ends (Fig.1). Micrometry of the microfilariae conducted by MAG vision microscope (Olympus) revealed the average length to be 499.3µm (Fig.2). The hematological

**Table 1:** Hemato-biochemical analysis of blood sample

| *Parameters* | *Values* | *Normal Reference Range* |
|---|---|---|
| Hb (g/dl) | 16.1 | 12-15 |
| PCV (%) | 45.7 | 37-55 |
| TEC (x $10^6$/µl) | 6.86 | 5.5-8.5 |
| TLC (x $10^3$/µl) | 16.1 | 6-16 |
| MCV (fl) | 66.6 | 60-77 |
| MCHC (g/dl) | 35.2 | 32-36 |
| DLC | | |
| Neutrophils (%) | 77 | 60-70 |
| Lymphocytes (%) | 13 | 12-30 |
| Eosiniphils (%) | 11 | 2-10 |
| Monocyte (%) | 03 | 3-10 |
| Basophil (%) | 00 | 0-1 |
| Platelets (x $10^5$ ) | 2.53 | 2-8 |

study revealed elevated hemoglobin (16.10 g/dl), with slight leukocytosis (16.1 x $10^3$/µl), marked neutrophilia (77.00%), and slight eosinophlia (11.00%), while other values like MCV, MCH, and MCHC falling in the normal range (Table 1).

## Treatment And Discussion

The severely infected dog was treated with an injection of Ivermectin @ 0.05 mg/kg b.w.S/c once, Tab. Doxycycline @ 10 mg/kg b.w, Tab. Hetrazan (Diethylcarbamazine) @ 1.5 mg/kg body weight and supportive treatment with Liv 52 syrup @ 7 ml per day for 21 days orally. After 21 days on microscopic re-examination, blood smear was found negative for microfilaria.

The prevalence of filariasis in India is reported to be steadily rising and spreading in various parts of the country. Very high prevalence of *D. immitis* in the molecular epidemiological studies in dogs from Northeastern states of India was reported by Borthakur *et al.* (2015). Similar to our observations, hematological findings with a high prevalence (18.03%) of *D. immitis* were reported from the Northeastern states of India (Borthakur *et al.,* 2015). While in Kerela and Karnataka, filariasis in dogs with the prevalence of 07.00% (n=160) and 21% (n=400) was reported, respectively, with the causal agent *D. repens*. Its zoonotic potential also has been reported in Kerala earlier (Sabu *et al*., 2005) and recently from Tamil Nadu (Gowrishankar *et al.,* 2019). In this study, we have reported the first time presence of filariasis in dogs in Porvorim, Goa, India.

## Acknowledgement

Authors sincerely acknowledge the support provided by the private diagnostic laboratory "Mascot diagnostic center, Margao, Goa" and Department of Veterinary Pathology, KNP College of Veterinary Science, Shirwal, Maharashtra.

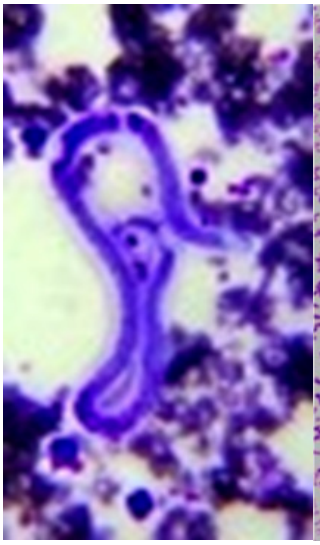

**Fig 1:** Giemsa stained smear

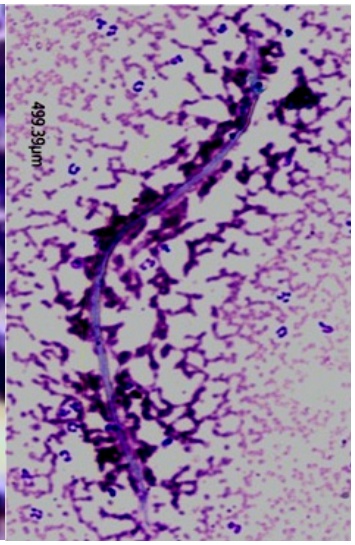


**Fig 2:** Micrometry

## References

Ananda, K.J., D'Souza, P.E., &Jagannath, M.S., (2006). Methods for identification of microfilaria of *Dirofilariarepens* and *Dipetalonemareconditum*.*Journal of Veterinary Parasitology, 20*,45–47.

Badhe B. P. & Sane, S. Y. (1989). Human pulmonary dirofilariasis in India: a case report. *The Journal of Tropical Medicine and Hygiene*. *92*(6), 425–426.

Borthakur, S.K., Deka, D.K., Islam, S., Sarma, D.K., Sarmah, P.C. (2015). Prevalence and molecular epidemiological data on *Dirofilaria immitis* in dogs from Northeastern States of India. The Scientific world Journal. https://doi.org/10.1155/2015/265385. article id 265385 (7pages).

Dam T. and Das P. 2006. The importance of dirofilariasis in India. *The Internet Journal of Parasitic Diseases,* 1(1), 2006

Gowrishankara S., Aravinda M., Sastyaa S., Lathaa B. R., Azhahianambia P., Vairamuthub S., Jayanthyc C. (2019). Dirofilaria hongkongensis – A first report of potential zoonotic dirofilariosis infection in dogs from Tamil Nadu. Veterinary Parasitology, Regional Studies and Reports, 06 Aug 2019, 18:100326DOI: 10.1016/j.vprsr.2019.100326 PMID: 31796197

Gupta S K & Singla LD (2012) Diagnostic trends in parasitic diseases of animals. In: *Veterinary Diagnostics: Current Trends*. Gupta RP, Garg SR, Nehra V and Lather D (Eds), Satish Serial Publishing House, Delhi, pp 81-112.

Joseph, E., Matthai, A., Abraham, L.K., Thomas, S., (2011). Subcutaneous human dirofilariasis.*Journal of Parasitic Diseases*, *35*, 140–143.

Joy, A., Narayanan, M., Ravi, T.V., Binu, P.S., (2017).Dirofilariasis: a report on emerging zoonosis in South India. J. Case Rep. *7*, 306–308.

MegatAbd Rani P. A., Irwin P. J., Gatne M., Coleman G. T., McInnes L. M., & Traub R. J., (2010).A survey of canine filarial diseases of veterinary and public health significance in India. *Parasites and Vectors*, *3*, article 30.

Montoya-Alonso J. A., Mellado I., Carreton E., Cabrera-Pedrero E. D., Morchon R., & Simon F. (2010). Canine dirofilariosis caused by *Dirofilaria immitis* is a risk factor for the human population on the island of Gran Canaria, Canary Islands, Spain. *Parasitology Research*, *107*(5), 1265–1269.

Reddy, M.V., (2013). Human dirofilariasis: an emerging zoonosis. *Tropical Parasitology 3*, 2.

Sabu L., Deveda K. and Subramanian H. (2004).Dirofilariosis in dogs & humans in Kerala.*The Indian Journal of Medical Research 121*(5), 691-693.

Simon F., Siles-Lucas M., &Morch´on R. *et al*. (2012). Human and animal dirofilariasis: the emergence of a zoonotic mosaic. *Clinical Microbiology Reviews 25*(3): 507–544.

Waren W. A. (2003). Heartworm disease. In: Nelson R. W., Couto C. G., editors. *Small Animal Internal Medicine*. 3rd. St. Louis, Mo, USA: Mosby; pp. 169–184.

Watanabe, Y.; Yang, C.H.; Tung, K.C.; Ooi, H.K. (2004). Comparison of microfilaria concentration method for *Setaria digitata* infection in cattle and for *Dirofilaria immitis* infection in dogs. *The Journal of Veterinary Medical Science 66*, 543–545.