

## DETECTION OF MICROFILARIA IN TOUCH SMEAR CYTOLOGY FROM MAMMARY TUMOUR

S. Sruthi<sup>1</sup>, K.S. Prasanna<sup>2</sup>, I. S. Sajitha<sup>3</sup> and Jessil Joseph<sup>4</sup>

<sup>1</sup>Ph.D. Scholar, <sup>2</sup>Assistant Professor and Incharge of the Department, <sup>3</sup>Associate Professor, <sup>4</sup>M.V.Sc. Student; Department of Veterinary Pathology; College of Veterinary and Animal Sciences, Mannuthy, Thrissur- 680651.. DOI 10.29005/IJCP.2024.16.1.101-103} [Received: 20.11.2023; Accepted: 16.02.2024]

**How to cite this article:** Shruthi, S., Prasanna, K.S., Sajitha, I.S. and Joseph, J. (2024) Detection of Microfilaria in Touch Smear Cytology from Mammary Tumour. Ind. J. Canine Pract., 16(1): 101-103.

Subcutaneous filariasis is caused by the filarial worm *Diriofilaria repens*, which is common in Kerala's wet tropical regions. In this study, two cases of subcutaneous filariasis in dogs with mammary carcinoma was reported to the University Veterinary Hospital, College of Veterinary and Animal Sciences, Mannuthy. Impression smear of the tumour mass revealed unsheathed microfilaria as well as neoplastic epithelial cells with pleomorphic, granular and hyperchromatic nuclei.

**Keywords:** *Dirofilaria repens*, Mammary carcinoma, Microfilaria, Unsheathed.

**Dirofilariosis**, a helminthic disease caused by filarial species of the genus *Dirofilaria* that typically domestic dogs, cats and other types of wild mammals (Simon *et al.*, 2017). Mosquito is the common vector incriminated for the transmission and maintenance of the microfilaria (Ajith *et al.*, 2016). Subcutaneous filariasis is caused by the filarial nematode; *D. repens* which is commonly seen in humid tropical regions like Kerala. Microfilaria can be found in peripheral circulation, whilst adult parasites are also discovered in subcutaneous and intramuscular tissue resulting in local eruptions. Immature larval stages prefer blood and lymph vessel (Ettinger, 2017). The most common cause of canine dirofilariasis in Kerala is *Dirofilaria repens*. Two unusual canine cases being diagnosed with dirofilariasis after having ductal mammary carcinoma are discussed here.

### Materials and Methods

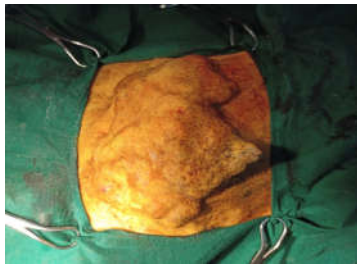
#### Case 1:

A 10 year old GSD female dog was presented with a huge mass of 11 cm x 11.5 cm x 5 cm

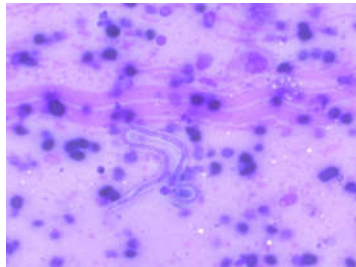
(Fig. 1) on the left caudal abdominal and inguinal mammary gland. Hematological investigation revealed leukocytosis, lymphopenia and microcytic RBC, (Table 1). Impression smear revealed the presence of unsheathed microfilaria over a background of homogenous eosinophilic material (Fig. 2). The smear was highly cellular with presence of neoplastic epithelial cells having pleomorphic, granular and hyperchromatic nucleus. On histopathological examination ductal carcinoma of mammary gland was detected (Fig. 3).

#### Case 2:

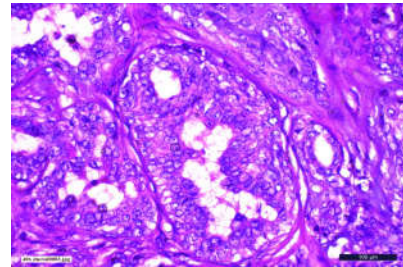
A six year old cross bred female dog was brought with a huge mass of 10 cm x 8 cm x 3 cm on right inguinal mammary gland (Fig. 4). Microcytic anaemia of low grade were detected in hematology. Impression smear revealed the presence of unsheathed microfilaria surrounded by neoplastic epithelial cells (Fig.5). On histopathological examination solid carcinoma of mammary gland was detected (Fig. 6).



**Fig. 1. Mammary gland affecting left caudal abdominal mammary gland**



**Fig. 2. Impression smear showing microfilaria (Field stain, 40X)**



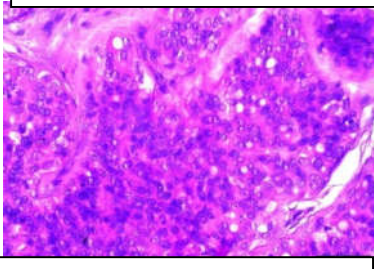
**Fig. 3. Ductal carcinoma of mammary gland. Proliferation of neoplastic epithelial cells inside duct lumen (H&E, 100X)**



**Fig. 4. Multinodular tumour mass in inguinal mammary gland**



**Fig. 5. Impression smear showing unsheathed larva of microfilaria (Field stain, 40X)**



**Fig. 6. Solid carcinoma of mammary gland. Proliferation of neoplastic epithelial cells as solid sheets obliterating duct lumen (H&E, 100X)**

**Table . 1. HEMATOLOGICAL PARAMETERS OF THE ANIMALS**

Hematological parameters	Case 1	Case 2	Reference range <sup>a</sup>
Total RBC count ( $10^6/\mu\text{l}$ )	5.43	5.32	5.0-7.9
Hemoglobin (g/dl)	12	11.3	12-19
Haematocrit (%)	32.9	31.38	36-60
Total WBC count ( $10^3/\mu\text{l}$ )	17.1	10.1	5.0-14.1
Total lymphocyte count ( $10^3/\mu\text{l}$ )	4.1	2.2	8-21
Total monocyte count ( $10^3/\mu\text{l}$ )	1.2	0.2	2-10
Total neutrophil count (%)	69.5	74.25	58-85
Platelet count ( $10^3/\mu\text{l}$ )	225	318	160-525
Mean corpuscular Volume (MCV) (fL)	60.6	59	66-77
Mean corpuscular haemoglobin (MCH) (pg)	22.1	21.2	21.0-26.2
Mean corpuscular haemoglobin concentration (MCHC) (g/dl)	36.5	36	32.0-36.3

\*Hematologic reference ranges, 10<sup>th</sup> edn. The Merck Veterinary Manual.

### Results and Discussion

Detection of filarial larva in touch smear cytology from mammary mass was incidental finding in these cases. The

morphological features of the larva were most compatible with that of *Dirofilaria repens*. In both the cases there was no evident overt clinical signs of dirofilariosis and detection of

microfilaria from a mammary tumour was an unconventional spurring for the further studies into the filarial diseases.

Hematological studies revealed low haemoglobin in case no. 2 which may be the result of destructive capability of microfilaria associated with severe intravascular hemolysis. It also might be connected to inflammation-associated production of proinflammatory cytokines from the tumour microenvironment as also reported by Lallo *et al.*, 2016. Leukocytosis and lymphopenia was noticed in case 1 which are commonly associated with helminthic infections as also mentioned by Wyszomolek and Magdalena, 2020. Mean corpuscular volume (MCV) was decreased in both the cases resulting in microcytosis which may be due to the proinflammatory cytokines secreted by the tumour cells as also recorded by Lallo *et al.*, 2016.

There are studies emphasising the relevance of fine needle aspiration cytology and nipple discharge cytology for the identification of microfilaria from breast lump as also elicited by Singh *et al.*, 2019 and Burgess *et al.* 2016. Cytology can provide valuable information and is cost-effective in the detection of the disease. Secreted fluid from a mammary duct can be smeared easily onto a glass slide for cytological assessment of the cellular material

### Summary

To the authors best knowledge this is the first case report of detection of microfilaria in carcinoma of mammary gland in India. The findings of the study highlight the value of cytological investigation, the adaptability of this technique as a standard diagnostic approach for the detection of microfilariasis, especially because of its occurrence in a non-endemic area.

### Acknowledgements

The financial and technical support provided by Kerala Veterinary and Animal Sciences University and Indian Council of Medical Research is acknowledged.

### References

- Ajith, Y., Nithya, C., Arathy, S., Jeny, G., Meera, K., Shemeema, A., Siji, S.R., Junaid, N. and Tresamol, P.V. (2016). Clinical management of a Labrador retriever dog concurrently infected with *Leptospira interrogans*, *Babesia gibsoni* and *Dirofilaria repens*. *Comp. Clin. Pathol.*, **25**: 1325-1330.
- Burgess, H.J. and Wagner, B. (2016). Identification of microfilaria in a mammary mass aspirate from a female dog. *Can. Vet. J.*, **57**: 374.
- Ettinger, S.J. (2017). Textbook of Veterinary Internal Medicine. 8<sup>th</sup> edn., Elsevier Saunders, St. Louis, USA. **Pp.** 1134.
- Lallo, M.A., Ferrarias, T.M., Stravino, A., Rodriguez, J.F. and Zucare, R.L. (2016). Hematologic abnormalities in dogs bearing mammary tumors. *Rev. Bras. Med. Vet.*, **23**: 3-8.
- Simón, F., González-Miguel, J., Diosdado, A., Gómez, P.J., Morchón, R. and Kartashev, V. (2017). The complexity of zoonotic filariasis epizootic and its consequences: a multidisciplinary view. *Bio. Med. Res. J.* **10**: 1115.
- Singh, T., Sandhu, G. and Singla, V. (2019). Filarial dance sign in breast lump. *BMJ Case Rep.* **12**(4): e229956.
- Wyszomolek and Magdalena, E. (2020). Case studies of severe microfilaremia in four dogs naturally infected with *Dirofilaria repens* as the primary disease or a disease complicating factor. *Frontiers in Vet. Sci.*, **7**: 577466.