

## CASE REPORT

### ECTOPIC DIROFILARIOSIS IN TWO DOGS FROM RIO DE JANEIRO STATE, BRAZIL

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#### SUMMARY

Report of two canine dirofilariosis cases of ectopic location in the state of Rio de Janeiro. This is the first report of erratic migration for this parasitosis in dogs in the state, calling attention to the short period of time between the two cases. The fact that the area is endemic for this parasite, its zoonotic potential and the report of human cases in the state, demonstrates that authorities should be alerted to the control programs of dirofilariosis along with the pathogenic profile of the infections.

**KEYWORDS:** Dirofilariosis ectopic; Dog; Human; *Dirofilaria immitis*.

#### INTRODUCTION

The species *Dirofilaria immitis* (Leidy, 1856) is a dixenic filarid parasite that infects dogs, cats and human beings among other animal hosts<sup>6,43</sup>. The intermediate hosts are mosquitoes from several genera, such as *Culex*, *Aedes* and *Anopheles*. The parasite has a worldwide distribution, and several endemic areas have been described in Brazil<sup>2,3,5,8,10,15,16,18,21,22,36,40</sup>. Canids are the most adapted definitive hosts and are the primary reservoir for parasite transmission, but reports about feline and human infection are becoming more frequent, including in Brazil<sup>4,6,24,33,39,42</sup>. Dirofilariosis is considered a zoonosis in human hosts since 1941, and although the parasite has been mostly described in the lungs, it has also been observed at the cardiovascular system, subcutaneous tissue, brain, testicle, eyeball, abdominal cavity and bladder<sup>1,14,20,24,32</sup>. In canids, the parasite is usually found in pulmonary arteries and right ventricle, where it may cause cardiopulmonary disease<sup>28</sup>. Immature adult worms may eventually migrate erroneously to unusual sites, such as the brain, liver, epidural space, anterior chamber of the eye, pericardial sac, subcutaneous tissue, bronchus and peritoneal cavity<sup>9,13,19,23,26,27,29,38,41,44</sup>. Erratic migrations have also been found in the anterior chamber of the eye of dogs in Italy<sup>11</sup>, Australia<sup>28</sup> and USA<sup>30</sup>. Additionally, there have been some reports of migrations to the abdominal cavity<sup>12,31</sup>. In Brazil, LENT & FREITAS (1937)<sup>25</sup> described an ectopic subcutaneous location in dogs, but the presence of *D. immitis* at the abdominal cavity was not observed. In a review published by BARBOSA & ALVES (2006)<sup>7</sup>, up to the year 2005 the Brazilian national prevalence of dirofilariosis in dogs was 10.2% based on microfilaremia and 9.1% based on circulating antigens. LABARTHE *et al.* (1997)<sup>21</sup> observed, in Rio de Janeiro State,

that 13.95% of dogs were microfilaremic and 7.98% of amicrofilaremic dogs had antigens detected by ELISA. In the same study, the region that included Maricá municipality was particularly noted for having a high prevalence, with 52.46% dogs demonstrating microfilaremia or the presence of circulating antigens. POUBEL *et al.* (2008)<sup>35</sup> also observed a high percentage in the same municipality, finding 33.3% of dogs infected. The aim of this study is to describe two dirofilariosis cases of ectopic location in dogs from Maricá municipality, located in the littoral area of Rio de Janeiro State.

#### CASE REPORTS

The first case was a 19-year-old male dog, mixed-breed, which showed no symptoms of the disease. A free immature adult inside the scrotum was observed and collected during an elective orchietomy. The second case was a 3-year-old female dog, mixed-breed, asymptomatic, which was submitted to an elective ovariosalpingectomy. During the surgery, a free adult female approximately 20 cm in length was observed and collected inside the peritoneal cavity. The parasites were identified according to LENT & FREITAS (1937)<sup>25</sup> and FURTADO *et al.* (2010)<sup>17</sup> and deposited in the Helminthological Collection of the Oswaldo Cruz Institute (CHIOC), number 35797 (whole mounts). Four months after the surgical intervention, the second animal died from distemper. During necropsy, three nematodes were observed in the abdominal region (two males measuring approximately 12 and 13 cm and one female measuring approximately 21.5 cm), three inside the pulmonary artery, and several inside the right chamber of the heart. None of the animals presented microfilariae in peripheral blood analyzed by Knott technique. The filarial

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antigen detection test was not performed in both cases. Both animals were previously treated with ivermectin for mange.

## DISCUSSION

Since no filarial antigen detection was performed, it is not possible to assure that the first dog did not have any *D. immitis* in its pulmonary arteries. Regardless, the use of drugs that modify fertility of adults and that are microfilaricidal at the high dose used to treat mange, could explain the absence of microfilariae in the blood of both animals. However, it is important to note that the Knott technique is not 100% sensitive, especially in cases of low microfilaremia. According to OH *et al.* (2008)<sup>31</sup>, this parasite has been observed in several anatomic sites, but the mechanism that induces erratic migration is still unknown. OTTO (1974)<sup>34</sup> hypothesized that immature stages may occlude small vessels leading to its rupture and release of those immature adults into aberrant locations, where they may mature into adults. The fact that both animals did not have clinical symptoms, and that they were from an endemic area, reemphasizes the need for promoting control and prevention measures for this parasitosis. The geographical conditions associated with sanitary conditions, pluviometric indexes, high concentrations of mosquito populations, and the increase of dogs, cats and other errant animals populations, allow the maintenance and dissemination of *D. immitis* among animals and mosquitoes. This situation favors the occurrence of outbreaks and accidental cases of human infection. The ectopic location of this parasite is not commonly reported in Brazil and, although the cases reported here could be considered from an endemic area, it is important to notice that the finding of *D. immitis* in unusual anatomical sites is not restricted to endemic regions<sup>11</sup>. Still, it is noticeable that two cases of ectopic dirofilariosis were diagnosed in dogs from the same area in a short period of time. More studies are needed to elucidate the mechanisms that drive these parasites to ectopic migrations. Additionally, many cases of canine dirofilariosis in the Maricá region have been frequently reported by veterinarians, including some of the authors, which denotes the need for control programs for this parasitosis, especially if we consider the close relationship between domestic animals and human beings, along with the zoonotic potential of this helminth, considering that cases of human dirofilariosis were already reported in the same state<sup>37</sup>.

## RESUMO

### Dirofilariose ectópica em dois cães do Estado do Rio de Janeiro, Brasil

Relato de dois casos de dirofilariose canina de localização ectópica no Estado do Rio de Janeiro. Este é o primeiro relato de migração errática para esta parasitose em cães no Estado, e chama a atenção o curto espaço de tempo entre os dois casos. O fato da região ser endêmica para a parasitose, seu caráter zoonótico e o relato de casos humanos no Estado, demonstram que as autoridades competentes devem estar atentas aos programas de controle da dirofilariose assim como no perfil patogênico da infecção.

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