

Transient solitary pulmonary nodule caused by *Dirofilaria immitis*

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ABSTRACT: The second described case of solitary transient lung nodule caused by *Dirofilaria immitis* is reported. Diagnostic thoracotomy can be avoided with the use of enzyme-linked immunosorbent assay (ELISA), and hence a conservative serological follow-up is warranted in endemic areas.

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Human pulmonary dirofilariosis is an emerging zoonosis [1]. Although widely known to veterinarians, most physicians are unaware of the occurrence of dog heartworm disease, even in endemic areas. The life cycle of *Dirofilaria immitis* [2] begins when sexually mature parasites, living in canine right heart, shed microfilariae into the bloodstream. Such shedding follows a circadian and seasonal rhythm that coincides with mosquito activity and, therefore, maximizes transmission. The development of microfilariae into infective larvae takes place in the intermediate host, a mosquito that can belong to over 60 species, most of them from the genera *Anopheles*, *Aedes* and *Culex*. After a mosquito bite, the larvae further mature in the subcutaneous tissue of their definitive host. *Dirofilaria immitis* then migrates to the right heart, where it matures sexually if the host is appropriate.

Human disease is a biological dead-end for the parasite: the larvae embolize to the lung, giving rise to a distal pulmonary infarction, and are unable to fully mature. When human disease is diagnosed, it usually appears as a solitary pulmonary nodule. The diagnostic problem it poses, involving bronchogenic carcinoma, can be the source of significant iatrogenic morbidity since invasive techniques must be used to demonstrate its somewhat innocuous nature.

The present report describes the first case in Europe, presenting as a transitory coin lesion; the transitoriness of dirofilariotic nodules has been reported only once [3]. The usefulness of enzyme-linked immunosorbent assay (ELISA) in the detection of pulmonary dirofilariosis and, hence, in the conservative management and follow-up of pulmonary nodules in areas endemic for canine heartworm disease is stressed.

Case report

A 27 yr old male complained of unspecific thoracic aches for two months, sometimes with pleuritic characteristics. He was in good health and did not refer dyspnoea, fever, rash or any other condition. The physical examination was unremarkable. Thoracic radiology disclosed a nodule in the left upper lobe (fig. 1). An ELISA test [4] against a saline extract of adults of *Dirofilaria immitis* gave a titre of 1/200 for immunoglobulin M (IgM) and was negative for IgG. Two months later, the nodule had disappeared; titres diminished to 1/100 for IgM at four months after diagnosis. The patient has remained symptomless.

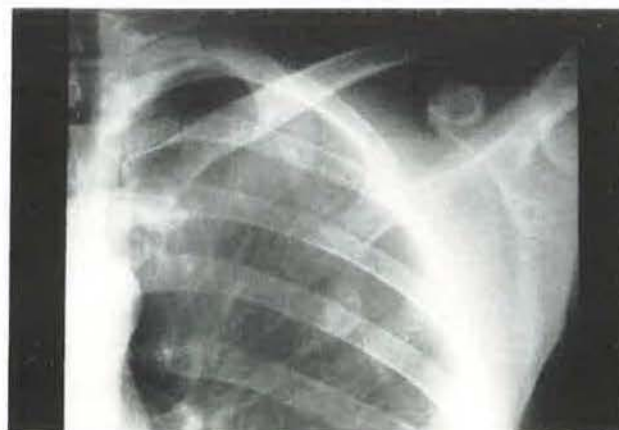


Fig. 1. - Pulmonary coin lesion in the left upper lobe.

Discussion

Up to 1981, 60 cases of pulmonary dirofilariosis had been described in the US [1]. The increase in the number of cases described parallels the spread of the canine infection in recent years and probably does not reflect a greater awareness of the disease [1].

The diagnosis of pulmonary dirofilariosis is based on histological findings. Usually, thoracotomy has been used to excise the nodule, but fine needle aspiration biopsy is also a useful and less aggressive alternative [5]. Although serological diagnosis by haemagglutination and complement fixation tests has been considered to be of little value because of the lack of specificity [1], recently developed ELISA techniques have been shown to be highly sensitive [4, 6, 7].

The data regarding the radiological evolution of dirofilarial pulmonary nodules are scanty, since most cases described have been diagnosed pathologically after surgical removal of the lesion. Radiological follow-up has been reported in 4 patients [1]; in one of them the period of observation was 13 yrs. With the exception of this later case, where the lesion had become calcified, no changes in the size and characteristics of the nodules have been observed. Only one report of a transient dirofilarial lung granuloma has been made [3]. Additionally, the shortest interval described between a previously normal chest film and a positive one is 3 wks [8]. Accordingly, granulomas around the *Dirofilaria* seem to develop rapidly. Taken together, these data point to the possibility of the transient nature of some, if not many, dirofilarial lung nodules. Besides factors related to the method of entry of infective larvae [9], this transitoriness would account for the low occurrence of dirofilarial lung nodules in man compared with the prevalence of heartworm disease in dogs, since solitary transient lung nodules can pass undetected unless an X-ray is made for another reason. An alternative explanation is that in infected people, the parasite is destroyed in the subcutaneous tissue and, hence, no pulmonary embolization and nodule development takes place.

Although clinically benign, iatrogenic morbidity can be important in view of its radiological resemblance to bronchogenic or metastatic tumour. In our opinion, a "wait and see" attitude is prudent in endemic areas if ELISA detects antidirofilarial antibodies; moreover, fine needle aspiration biopsy is an acceptably less aggressive approach to diagnosis and should be considered prior to thoracotomy [5]. With the dramatic increase in the area of canine disease, many new human cases are to be expected; only this conservative attitude could hamper the inclusion of this disease in the logistics of iatrogenic casualty feared by some investigators.

The case reported is the first described in Europe, but our finding of 5.2% human serological reactivity in an area of high canine heartworm disease [4] shows that the infection is heavily underdiagnosed. This is consistent with the situation in other countries [7]. We are presently unaware if all seropositive patients have developed transient pulmonary nodules, or whether antibody production indicates a subcutaneous infection that has not progressed to pulmonary embolization of the parasite. The development of ELISAs with antigens specific for different larval stages, currently underway at our laboratory, will address this question.

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Observation clinique. Foyer rond pulmonaire solitaire transitoire dû à Dirofilaria immitis. M. Cordero, M.R. Muñoz, A. Muro, F. Simón.

RÉSUMÉ: Présentation d'un deuxième cas de nodule pulmonaire transitoire dû à *Dirofilaria immitis*. L'utilisation de l'ELISA permet d'éviter la thoracotomie diagnostique, et un suivi sérologique conservateur peut être recommandé dans les régions d'endémie.

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