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Canine Heartworm in Human Lung

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Summary

The canine heartworm (*Dirofilaria immitis*) is an infrequent cause of pulmonary coin lesions in humans. We recently treated a 49-year-old man with two coin lesions in his right lower pulmonary lobe. Owing to the likelihood of metastatic disease, a diagnostic thoracoscopy was undertaken. This method did not allow the visualization of both lesions, however. Accordingly, thoracotomy was performed. Upon removal, the nodules proved to be necrotizing granulomas containing canine heartworm fragments. The literature contains only five previous reports of pulmonary dirofilariasis involving multiple lesions in a single patient.

KEY WORDS: Canine heartworm - Human lung - Dirofilariasis - Pulmonary coin lesion.

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Introduction

Since the late 1940s, the canine heartworm (*Dirofilaria immitis*) has been encountered with increased frequency in man. The first case of human dirofilariasis resulting in pulmonary infarction was reported by Dashiell in 1961.[1] By 1982, some 60 cases had been documented in the United States.[2] However, in only three of these cases was more than one heartworm present. Subsequently, two other reports of multiple lesions were published.[3,4] We describe an additional case of pulmonary infarction involving two unilateral nodules.

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Case Report

A 49-year-old man was admitted to our hospital after a routine chest roentgenogram disclosed two coin lesions in his right lower pulmonary lobe. Although a smoker, he reported no coughing or haemoptysis. A week earlier, he had presented with chest pain, and cardiac catheterization had shown mild-to-moderate coronary artery disease for which medical treatment was initiated.

At the present admission, there was no sign of congestive heart failure. Laboratory values were unremarkable. Computer tomography of the chest confirmed the presence of the nodules (Fig. 1). The patient's history failed to disclose an environmental cause, and an immunologic workup revealed no specific antigenic agent. Examination of pulmonary secretions yielded inconclusive results.

Because of the likelihood of metastatic disease, the patient underwent diagnostic thoracoscopy. Only

one of the nodules could be visualized with this method, however. Therefore, a thoracotomy was necessary for removal of the lesions.

Pathological examination showed two discrete, well-circumscribed necrotizing granulomas that measured 1.2 cm and 0.9 cm, respectively, in maximum diameter. In each case, the necrotic zone was surrounded by a fibrous rim containing lymphocytes and giant cells, and a central thrombosed pulmonary artery exhibited dirofilarial fragments (Fig. 2). The worms' thick cuticle and prominent musculature were clearly identifiable.

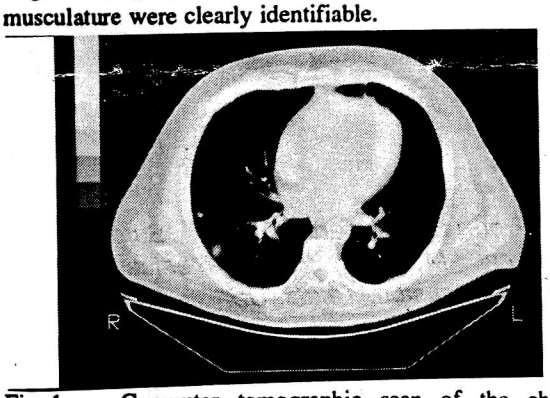

Fig. 1. Computer tomographic scan of the chest, showing two noncalcified nodules in the right lower lobe.

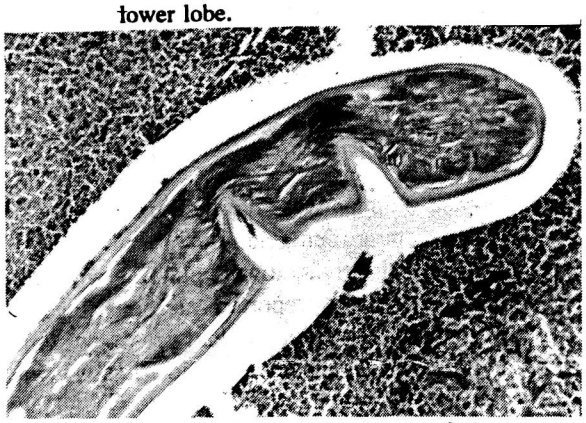

Fig. 2. Close-up photograph of one of the worms, showing its situation within a small, necrotic pulmonary vessel, and its thick cuticle and somatic muscle (H & E x 100).

Discussion

The characteristic environment for *D immitis* is the right ventricle and pulmonary artery of dogs, but other mammals may also serve as hosts. The worm's life cycle has been described elsewhere.[5] Because the human heart is an uncongenial environment for the parasite, it dies and embolizes to the lungs, where it is walled off by an immune response.

In the United States, canine *D immitis* infestations are most common along the eastern seaboard, the Gulf Coast, and the Mississippi Valley. The typical human host is a middle-aged man; no pediatric cases have been reported. Although most infections involve a solitary worm, as many as three parasites have been found in a single pulmonary lobe.[3] Bilateral involvement has also been reported.[4,6,7] Usually, the condition is discovered during routine chest X-ray examination. In symptomatic patients, chest pain and cough predominate, with occasional haemoptysis. Like many previous victims, our patient had no pets. Infection is presumed to have been transmitted via mosquito bite.

Because *D immitis* lesions are radiologically well-circumscribed, noncalcified, and unaccompanied by a surrounding infiltrate, they are usually mistaken for a primary or secondary malignancy. If the resected tissue specimen is carelessly trimmed, the parasite may be lost and the condition attributed to some other granulomatous process.

Obstruction of a small pulmonary artery has no clinical significance, and removal of these lesions would be unnecessary if they could be diagnosed preoperatively. Consequently, owing to the lack of a definitive method of preoperative diagnosis, patients with the above-described features must continue to undergo thoracoscopy or thoracotomy and resection.

Acknowledgements

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