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Human pulmonary dirofilariasis: report of a new European case

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Summary. We report a new European case of pulmonary dirofilariasis occurring in an Italian patient.

The paper emphasizes the peculiar pathological features of Pulmonary Dirofilariasis, that, on clinical and radiological grounds, closely imitates primary or secondary neoplasms.

The disease characteristically presents itself as a solitary subpleural coin-like lesion, histologically corresponding to a well demarcated, roughly spherical infarct, centered by a medium-sized thrombosed artery whose lumen contains the parasite, i.e. a *Dirofilaria* nematode.

Key words: Pulmonary dirofilariasis, Lung, Coin lesions

Introduction

Dirofilaria is a filarial nematode with a worldwide distribution. The dog is the principal reservoir, mosquitos serve as vectors, the human lung represents the main target organ for pathology. Human pulmonary dirofilariasis is spreading widely in the United States (Ciferri, 1982; Ro et al., 1989); in contrast it seems to be exceedingly rare in Europe, a single case having been reported so far (Pampiglione et al., 1984).

The present report deals with a further case of pulmonary dirofilariasis occurring in an Italian patient, and emphasizes the peculiarity of its morphological features.

It is hoped that this may stimulate the recognition of additional cases.

Materials and methods

The patient was a 58-year-old man, heavy smoker, living in the countryside in close contact with several animals including dogs. He had been complaining for two months of cough and pain in the left lower chest. A lung X-ray revealed a diffuse infiltrate and a peripheral coin lesion in the inferior left lobe. The coin lesion still persisted after two months.

Blood examination, routine chemistry and bronchoscopy were normal. Because of the clinical and radiological suspicion of a peripheral lung cancer, a lobectomy was performed.

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Results

The resected specimen contained a 1.5 x 1.4 x 1.2 cm-sized well demarcated roughly spherical, soft, grey nodule in the context of otherwise unremarkable parenchyma (Fig. 1). The local visceral pleura was thickened. Histological sections stained with HE, PAS and elastic van Gieson revealed a central area of infarct with preserved alveolar outline, surrounded by a distinct fibrotic border with a granulomatous infiltrate containing epithelioid histiocytes, multinucleated giant cells, eosinophils, lymphocytes and plasmacells. The lumen of a medium-sized artery was partially thrombosed and contained a longitudinally and cross-sectioned worm, i.e. the *Dirofilaria*. The nematode showed a thick multilayered cuticle, prominent internal longitudinal ridges and a band of ill-defined somatic musculature (Fig. 2). The worm measured about 160 microns in diameter.

Discussion

This is the second European case of pulmonary dirofilariasis.

The first case was described by Pampiglione et al. (1984). In that case a *D. repens* was the causal agent. The morphological characteristics of the parasite in our case, particularly the smooth appearance of the external cuticle, was not absolutely different from *D. repens*,

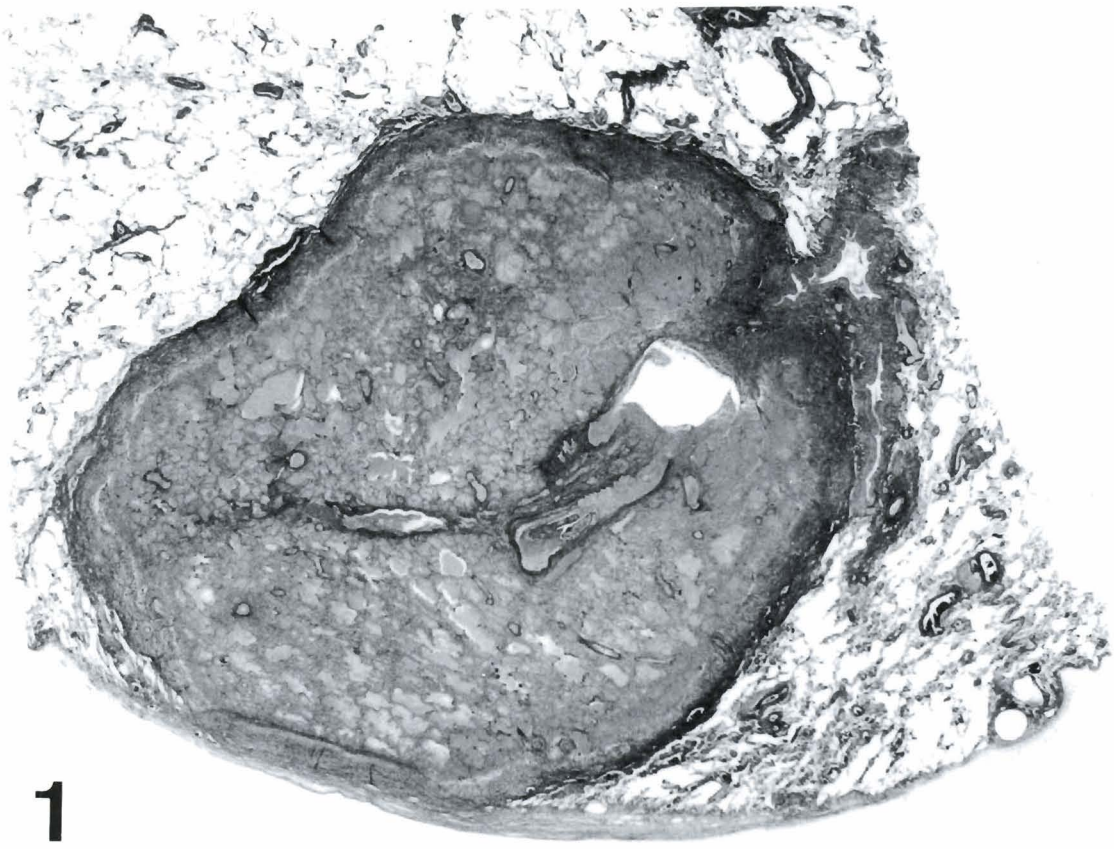

Fig. 1. Overview of sharply demarcated roughly spherical infarct in a subpleural location. A *Dirofilaria* nematode is visible in the lumen of a medium-sized artery. × 40

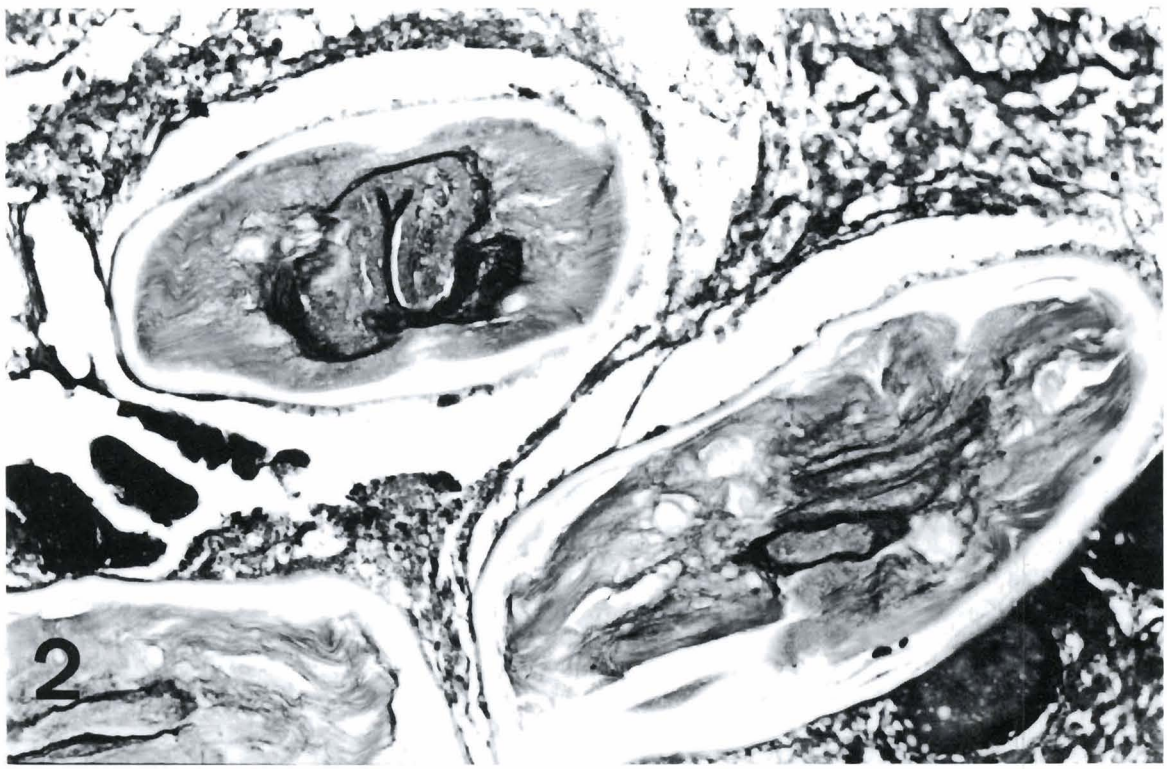

Fig. 2. The photomicrograph shows section of a *Dirofilaria* nematode. Note the thick smooth cuticle of the parasite. × 250

althought it would better fit with *D. immitis*. The patient, similar to all previously reported cases (Kochar, 1984; Ro et al., 1989); presented a subpleural coin-like lesion closely mimicking a peripheral lung cancer, particularly as he was a heavy smoker with persistent cough.

The correct diagnosis could be made only by pathological examination of the excised lesion, as its morphology was highly characteristic. The differential diagnosis included classic pulmonary infarct and necrotizing granulomata. The former displayed a pyramidal (not spherical) shape and lacked the peripheral palisade of epithelioid histiocytes. In the latter, the central liquefaction and caseation necrosis resulted in a complete effacement of the normal lung architecture.

The histological recognition of the aetiological agent, *Dirofilaria*, required careful examination of sections due to the faintly eosinophilic staining of the parasite (Ciferri, 1982; Ro et al., 1989). The worm is frequently detected in only one or two sections, therefore serial sectioning of the entire specimen may be required. The dirofilarial worm is distinguished from other nematodes such as *ascaridis, strongyloids* and *hookworm* larvae because of the larger size. In addition, the *Dirofilaria* is present in the pulmonary vessels, whereas other nematodes are found in the tracheobronchial tree.

In conclusion, this case of pulmonary dirofilariasis occurring in an Italian patient, might be the second European case of pulmonary *D. repens* or might alternatively, represent the first European case of *D. immitis*, thus indicating the spreading or the presence in Europe of such a nematode.

This disease should be considered in the differential clinical diagnosis of coin-like subpleural solitary lesions.

The highly characteristic morphological features should direct the pathologist's search for the parasite in tissue sections.

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