# Rapid Subcutaneous Migration of *Dirofilaria repens* Nematode in Facial Tissue, Italy

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We report a *Dirofilaria repens* nematode infection in a woman in Italy who sought care for a fast-creeping lesion within her subcutaneous facial tissue. Dirofilariosis should be included in differential diagnosis of subcutaneous nodules or creeping lesions. This case highlights the need for controlling canine dirofilarioses to mitigate zoonotic risk.

Dirofilarioses are mosquitoborne zoonotic diseases caused by filarial nematodes, which affect domestic and wild carnivores in tropical, subtropical, and temperate areas worldwide (*1*). Humans act as dead-end hosts because the third stage larvae, which are transmitted by mosquitoes during the blood meal, do not usually reach sexual maturity. Human cases of dirofilariosis have been documented worldwide; *Dirofilaria immitis* and *D. repens* nematodes have been reported from both the New and Old World (*2*). In humans, subcutaneous lesions caused by *D. repens* nematode infection can occur in several anatomic areas (e.g., forehead, arms, and periorbital and perioral areas) and, rarely, in deeper tissues (e.g., lymph nodes, lungs, muscles, and dura) (*3*). In addition, pulmonary localization of *Dirofilaria* spp. is characterized by the presence of solitary, well-circumscribed, noncalcified peripheral subpleural pulmonary nodules (coin lesions), which mimic lung cancer (*4*). In the Mediterranean Basin, ideal climatic conditions for the development of mosquito vectors, as well as the high prevalence of microfilaremic dogs, are risk factors for human infections, as observed in areas highly endemic for canine dirofilariosis, such as southern Italy (*5*,*6*). Specifically, in Europe, *D. repens* is considered an emerging pathogen, because it presents an expanding distribution linked to an increasing number of human cases (*4*). We report a case of human dirofilariosis in a woman in her forties, living in Rome, Italy, with 3 cats as pets.

The patient first underwent ophthalmologic consultation because of visual impairment; her condition was initially misdiagnosed as an allergic reaction of the right upper eyelid. Five days later, the patient was referred to the National Institute for Infectious Diseases Lazzaro Spallanzani after she reported a worm-like organism creeping within the subcutaneous tissue of the right lower periorbital region (Video, https://wwwnc.cdc.gov/EID/article/31/6/24-1915-V; Appendix Figure, https://wwwnc.cdc.gov/EID/article/31/6/24-1915-App1.pdf). No other clinical signs (e.g., dermo-epidermal eruptive patches) were recorded besides retroauricular lymphadenomegaly and low-grade fever (up to 38.0°C). The patient had not recently traveled abroad.

After signing informed consent, the patient was hospitalized but surgery was not performed because the suspected parasite (likely *Dirofilaria* spp.) had migrated to the right parietal area of the head (i.e., the subcutaneous tissue at the parietal bone of the skull), preventing its removal. During her 5-day hospitalization, the patient was in good clinical condition; hematological and serologic biochemical parameters were within reference ranges; eosinophilia was not present. Infections by *Strongyloides stercoralis* and zoonotic filarial worms (i.e., *Brugia* spp., *Wuchereria bancrofti*, *Mansonella* spp., and *Oncocherca* spp.) were excluded by serologic assays (i.e., commercial ELISA kits). Chest radiography was performed to exclude the presence of coin lesions typical of *Dirofilaria* spp. infection.

We tested a serum sample at the Department of Public Health and Infectious Diseases Sapienza, University of Rome, to assess exposure to *Dirofilaria*

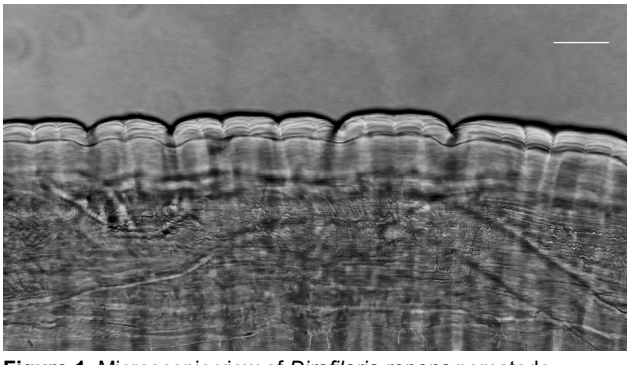

**Figure 1.** Microscopic view of *Dirofilaria repens* nematode extracted from subcutaneous facial tissue of a patient, Italy. Microscopic analysis revealed a thick laminated cuticle with characteristic longitudinal ridges and cross-striations, leading to the identification of the parasite. Scale bar indicates 100 μm.


**Figure 2.** Phylogeny of *Dirofilaria repens* based on *cox*1 gene sequences in study of rapid subcutaneous migration of *D. repens* nematode in facial tissue, Italy. The sequence from this study is shown in bold. *Wuchereria bancrofti* was used as outgroup. Bootstrap confidence values (1,000 replicates) are shown at the nodes only for values >60%.

spp. by using an in-house ELISA based on somatic antigens of adult *D. repens* (*6*,*7*), which yielded positive results (i.e., optical density 1.56; optical density cut off 1.03 for *D. repens*). The woman was discharged from the hospital with the recommendation to return on observation of parasite reemergence to the facial subcutaneous tissue.

Two weeks later, the nematode migrated in the frontal area, and a surgical excision was performed under local anesthesia. The specimen was shipped to the University of Bari (Italy) for further morphological and molecular analysis. The fragmented nematode was morphologically identified as a mature female, cylindrical, ≈2.96 cm in length, and 0.480 mm thick (Figure 1). Microscopic analysis revealed a thick laminated cuticle with characteristic longitudinal ridges and cross-striations (Figure 1), leading to the identification of the parasite as *D. repens* (*8*).

Genomic DNA was extracted from the nematode and tested by conventional PCR targeting *cox*1 gene (*9*) to obtain a reference sequence. BLAST (https://blast.ncbi.nlm.nih.gov) analysis revealed 100% nucleotide identity with reference sequence of *D. repens* in the GenBank database (accession no. MW675692), which further confirmed by phylogenetic analyses (Figure 2). At the 5-month follow-up, the patient's only residual symptom was a persisting uncomfortable feeling, likely associated with parasite migration. We also performed specific tests to detect *Dirofilaria* spp. on her pets, yielding negative results.

The increasing incidence of human cases of dirofilariosis in Europe (*10*) underscores the need for including this emerging zoonotic disease in the differential diagnosis of pulmonary or subcutaneous nodules in absence of eosinophilia. The rapid migration of the nematode in this case was unusual, highlighting the variability of clinical signs in patients infected by *D. repens* nematodes, which range from stationary nodules to fast-migrating lesions in subcutaneous tissues. Human dirofilariosis is typically an abortive infection because humans are accidental hosts, and microfilaremia is absent (*1*). Consequently, traditional diagnostic methods applied in veterinary medicine (e.g., Knott's test) are unsuitable. Definitive diagnosis in human patients is challenging, and often only achievable after surgical removal of the parasite.

In summary, we identified *D. repens* nematode infection in a woman with a creeping lesion in her subcutaneous facial tissue. This case highlights the need for a One Health approach in implementing vector control strategies and regular monitoring of reservoir hosts in endemic areas to mitigate the risk for human *D. repens* infection.

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Dr. Carbonara is a research fellow at the Department of Veterinary Medicine, University of Bari. Her main research interest is in vectorborne pathogens of zoonotic concern in both animals and humans.

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# *Ehrlichia chaffeensis* DNA in *Haemaphysalis longicornis* Ticks, Connecticut, USA

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Informed by passive tick surveillance, we collected questing *Haemaphysalis longicornis* ticks from southwestern Connecticut, USA. Of 445 ticks tested by PCR, 3 nymphs were positive: 1 for *Ehrlichia chaffeensis* and 2 for *Borrelia burgdorferi*. This finding highlights the enduring public health challenges of invasive ticks and associated pathogens.

*Ehrlichia chaffeensis* is the most common causative agent of human monocytic ehrlichiosis (HME) and is transmitted primarily by the lone star tick (*Amblyomma americanum*) (*1*). Frequently reported from the southeast and south central United States, HME cases increased nearly 15-fold during 2001–2019 (from 142 to 2,093 cases), and then decreased substantially in 2020 (n = 1,178 cases), likely due to the COVID-19 pandemic. In subsequent years, disease cases remained lower than prepandemic levels. In Connecticut, reported HME cases totaled just 2 during 2008–2018; however, since 2019, reports from Connecticut indicated an annual recurrence of the disease, and cases increased to a total of 28 during 2019–2023. As with other tickborne diseases, convincing evidence indicates the number of HME cases is underreported and because of the recent range expansion of *A. americanum*, particularly in northeast sections of the United States, investigators anticipate an increase in disease cases (*2*).

Native to eastern Asia and invasive to Australia, New Zealand, and several Pacific Islands, the first report of *Haemaphysalis longicornis* in the United States came from New Jersey in 2017 (*3*), and the species subsequently spread into at least 21 mostly eastern and northeastern states (Figure, panel A) (*4*). Because of its wide host range and ability to survive in an expansive breadth of climatic conditions, *H. longicornis* will likely spread to and establish populations across a large portion of the United States (*5*). This tick is a