Polish Annals of Medicine

Journal homepage: https://www.paom.pl

Case Report

Subconjunctival *Dirofilaria repens* infection in a human patient in Poland: a case report

Katarzyna Kowalczyk, Patrycja Kuklo, Janusz Pieczyński

Department of Ophthalmology, University of Warmia and Mazury, Collegium Medicum, School of Medicine, Olsztyn, Poland
Department of Ophthalmology, The Regional Specialist Hospital in Olsztyn, Poland

ARTICLE INFO

Article history
Received: November 19, 2025
Accepted: December 29, 2025
Available online: December 31, 2025

Keywords
Parasite
Conjunctiva
Eye
Dirofilaria repens
Nematode
Ocular

Doi
https://doi.org/10.29089/paom/216171

ABSTRACT

Introduction: *Dirofilaria repens* is a parasite of dogs and other carnivorous mammals, transmitted primarily by mosquitoes. Humans are only rarely identified as accidental hosts of this nematode; however, in recent years an increasing number of human dirofilariasis cases has been documented. We present a case of human *D. repens* infection in Poland, a parasite traditionally endemic to warm climatic zones.

Aim: This case report presents a human *D. repens* infection in Poland diagnosed primarily on the basis of ocular symptoms, emphasizing the atypical geographic setting and the need to consider parasitic infections in the differential diagnosis of ocular lesions in temperate climates.

Case Study: The 49-year-old woman developed an ophthalmological infection that manifested as a subconjunctival, light motile mass. The intact worm was surgically extracted under local anesthesia and subsequently identified as *D. repens* at the Parasitology Laboratory of the National Institute of Public Health in Warsaw.

Results and discussion: The report reviews the typical geographic distribution of *D. repens* and its increasing occurrence in atypical regions, including Poland. Factors contributing to this spread, such as climate change and the migration of carnivores or insects are discussed. Increased human mobility and globalization may also represent important contributing factors. Common clinical manifestations, particularly ocular involvement, and current treatment approaches are summarized.

Conclusions: Human dirofilariasis caused by *D. repens* is among fastest-spreading zoonosis in Europe. Given its emergence in cooler climates, it should be included in the differential diagnosis of atypical ophthalmological lesions.

Corresponding author: Katarzyna Kowalczyk; Department of Ophthalmology, Faculty of Medicine, University of Warmia and Mazury in Olsztyn, Warszawska 30, 10-082 Olsztyn, Poland.
E-mail address: katarzyna.kowalczyk@uwm.edu.pl

1. INTRODUCTION

Dirofilaria repens is a filarial nematode of the family *Onchocercidae* that infects dogs and other carnivores (e.g. cats, foxes, wolves). Humans may serve as incidental hosts, although such infections are rare.[1] The parasite is transmitted primarily by mosquitoes (genera – *Culex*, *Aedes*, *Anopheles*).

Dirofilaria repens is endemic to warm climates on several continents; in Europe it is most common in Mediterranean countries, although its prevalence has increased in Eastern Europe in recent decades.[1,2]

In animal hosts, adult worms are typically found in subcutaneous or intramuscular connective tissue. *Dirofilaria* may also migrate to the ocular region or, less frequently, to internal organs such as the lungs.[3–5] Adult female worms release microfilariae into the peripheral blood of the mammalian host. These are ingested by competent mosquito vectors (intermediate host) during a blood meal, then undergo larval development to subsequent stages, until the moment the parasite is ready to be transmitted to the next host.[2] The completion of the parasite's developmental cycle is strongly influenced by ambient temperature and humidity.[6–9] In mammals, the larvae mature into adult worms after transmission.[2] In dogs, the prepatent period ranges from 189 to 239 days, although shorter periods have been reported.[8] The average lifespan of *D. repens* is 2–4 years, with females capable of producing microfilariae throughout their lifetime, potentially.[10]

In humans, the parasite typically does not reach full maturity. Infective larvae transmitted during a mosquito bite often die shortly afterward without causing any symptoms, or resulting in localized and self-limiting infections. No clear predisposing factors are known to explain why, in rare cases, further larval development occurs.[11,12]

Clinical manifestations of human *D. repens* infection vary. Local allergic reactions – erythema, swelling, and pruritus – may occur after the mosquito bite.[11,12] Immunosuppressed patients are at risk for more advanced infections and several such cases have been documented.[11–18]

2. AIM

This report presents a case of subconjunctival human *D. repens* infection, diagnosed in Poland. The parasite occurs endemically in warm climatic regions across multiple continents and is considered endemic in such areas; in Europe, its presence has been documented predominantly in Mediterranean countries. However, over recent decades, an increasing number of cases have been reported in Northern and Eastern Europe, suggesting a gradual geographical expansion of the parasite's range.[1,2]

3. CASE REPORT

A 49-year-old woman presented to the The Regional Specialist Hospital in Olsztyn, Poland with complaints involving the left eye. She reported a 3-day history of periocular and palpebral swelling accompanied by conjunctival redness and edema. On the day of ophthalmologic consultation, she noted a light-colored motile mass beneath the conjunctiva. She denied ocular trauma, foreign body sensation, previous similar

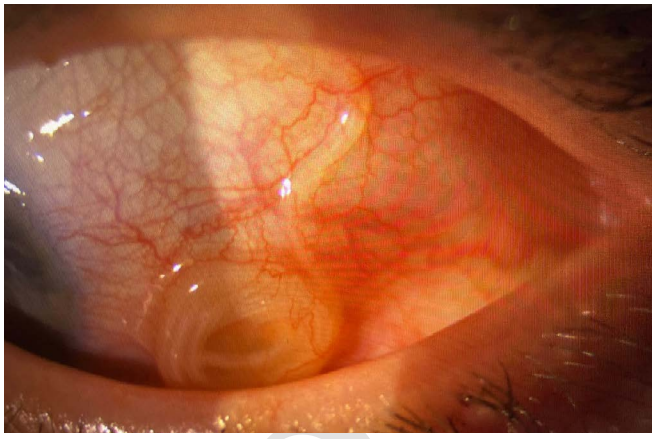

Figure 1. *Dirofilaria repens* visible in the patient's subconjunctival space.

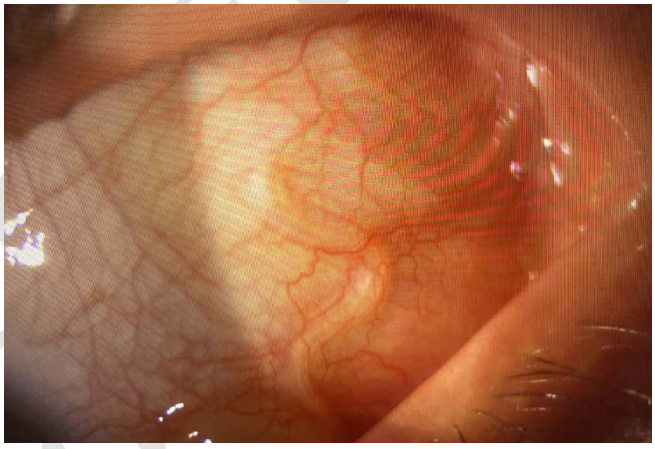

Figure 2. *Dirofilaria repens* visible in the patient's subconjunctival space.

Figure 3. The intact worm extracted from the subconjunctival space (shown for size comparison with a 3-mL syringe).

episodes, or recent travel abroad. The patient lived near a forested area (in the Warmia–Masuria region of Poland), with dogs and cats present in the immediate vicinity. Slit-lamp examination revealed a motile worm in the subconjunctival space of the left eye (Figures 1 and 2). Examination of the right eye was normal. Visual acuity was 5/6 (left eye) and 6/6 (right eye) – using the Snellen chart. Systemic examination was unremarkable, and no intraocular involvement was identified. The intact worm was surgically removed under local anesthesia (Figure 3), placed in formaldehyde, and sent to the National Institute of Public Health in Warsaw.

The parasite was thin, whitish, and elongated, measuring approximately 6–7 cm in length, with morphology consistent with *Dirofilaria*. It was later confirmed to be *D. repens* (female nematode).

Approximately 2 weeks before the ophthalmology visit, the patient reported transient erythema on the thigh that later migrated to the hip and lower abdominal region. After resolution of the skin changes, she developed mild shortness of breath and was evaluated at a primary care facility, where she had chest X-ray and blood morphology. The tests were unremarkable, and symptoms resolved spontaneously within 2–3 days. During the hospital visit, chest radiography and non-contrast head CT scan revealed no abnormalities. Peripheral blood morphology showed a slightly increased percentage of eosinophils.

4. RESULTS AND DISCUSSION

In recent years, *D. repens* has been increasingly reported in Europe, including the regions where the parasite was previously considered rare.[5,12,19–21] There is also a noticeable increase in awareness of this paracytosis for example: dogs testing, using specific chemoprophylaxis for dogs or other carnivores.[22] Human dirofilariosis can be prevented by minimizing exposure to mosquito bites through the use of repellents.[23]

In Poland, canine infections were first documented in 2009,[24] and the first human case was reported in 2008.[25] A study conducted by the University of Warsaw (2016–2022) identified *D. repens*-positive wild carnivores in 4 Polish regions: Masovia, Lesser Poland, Pomerania, and Warmia–Masuria. The highest prevalence was recorded in Central Poland (Masovia region), correlating with earlier epidemiological findings.[26]

Climate change may contribute significantly to the spread of *Dirofilaria* species by altering mosquito distribution and increasing the number of competent vectors.[27,28] Global warming facilitates expansion of *Culicidae* mosquitoes in Northern and Eastern Europe, increasing the risk of autochthonous infections in regions where such invasions were previously rare or not reported at all.[27] Relocation of infected animals, particularly dogs, from endemic to non-endemic areas also contributes to parasite dissemination.[29]

In infected individuals, the developmental stages of *D. repens* migrate subcutaneously for weeks to months, typically causing mild or unnoticed symptoms,[11,12,30] only occasionally inducing larva migrans–like manifestations (e.g., irritation and itching). After several weeks to months *D. repens* may cease migration and form a nodule,[11,12] most commonly in subcutaneous tissues in various regions of the human body. These nodules are predominantly located in superficial facial tissues, for example subconjunctivally,[11,12] but may also occur in the soft tissues of the hand[31] and lower leg,[32] the hypogastrium,[32] as well as the scrotum and testicles.[2] In rare cases, the nematodes may reach deeper anatomical sites, including lymph nodes,[32] the abdominal cavity,[32,33] lungs,[11,34–36] muscles,[37] and even the dura mater.[38]

The diagnosis of *D. repens* infection in humans depends on the anatomical localization of the parasite and the associated clinical manifestations. When the infection presents as *larva migrans*, particularly in the subconjunctival region, the clinical presentation is strongly indicative of *D. repens* infection. The patient's medical history should also rule out travel to regions endemic for other filarial parasites (like *Loa loa* in Africa).[2]

In theory, no specific treatment is required in humans, as *D. repens* typically does not induce severe clinical symptoms and generally dies spontaneously after a certain period of time.[11,12] Once *D. repens* has developed into a localized, stationary nodule, surgical excision may be performed in accordance with standard procedures appropriate to the anatomical site of infection.[2]

Subconjunctival worms can be removed quite easily (surgically) with generally favorable outcomes.[11,39,40] Sometimes the parasite is able to migrate in the intra-, peri-, or retro-ocular space.[2] In case of intraocular penetration, complications such as glaucoma, uveitis, or retinal detachment may occur and can lead to vision loss.[11,12,41–45]

Pharmacological therapy with anthelmintic agents, such as albendazole, in combination with doxycycline has been shown to arrest parasite migration and facilitate the development of a localized nodule that can subsequently be surgically excised.[46] Following removal of *D. repens*, no additional medical therapy is necessary, except in immunocompromised patients or in the extremely rare situation in which a second nematode infection is suspected.[11,12] Owing to the rarity of human dirofilariosis, no standardized treatment guidelines are currently available.[2]

5. CONCLUSIONS

(1) *Dirofilaria repens* infection is currently considered the fastest-spreading zoonosis in northern Europe, with an increasing number of human cases reported annually.
(2) While most patients become infected during travel to endemic regions, several autochthonous cases have been documented in Poland since 2009, with numbers steadily rising.
(3) Data from central Poland indicate that *D. repens* has become established in the region and is successfully spreading.

(4) The infection should be considered in patients presenting with subcutaneous nodules, palpebral swelling, orbital, conjunctival inflammation, or other unexplained ocular symptoms.

Conflict of interest

Authors declare that there is no conflict of interest.

Funding

None declared.

References

1 Cielecka D, Żarnowska-Prymek H, Masny A, Salamtin R, Wesołowska M, Gołab E. Human dirofilariosis in Poland: the first cases of autochthonous infections with Dirofilaria repens. *Ann Agric Environ Med*. 2012;19(3):445–450.

2 Capelli G, Genchi C, Baneth G, el al. Recent advances on Dirofilaria repens in dogs and humans in Europe. *Parasit Vectors*. 2018;11(1):663. https://doi.org/10.1186/s13071-018-3205-x.

3 Otranto D, Eberhard ML. Zoonotic helminths affecting the human eye. *Parasit Vectors*. 2011;4:41. https://doi.org/10.1186/1756-3305-4-41.

4 Di Cesare A, Otranto D, Di Giulio E, et al. Microfilarial periodicity of *Dirofilaria repens* in naturally infested dogs. *Parasitol Res*. 2013;112:4273–4279. https://doi.org/10.1007/s00436-013-3619-5.

5 Sałamatin RV, Pavlikovska TM, Sagach OS, et al. Human dirofilariasis due to Dirofilaria repens in Ukraine, an emergent zoonosis: epidemiological report of 1465 cases. *Acta Parasitol*. 2013;58:592–598. https://doi.org/10.2478/s11686-013-0187-x.

6 Bain O. Development of the canine filarial worm *Dirofilaria repens* Railliet and Henry, 1911, in halophilic *Aedes* mosquitoes in the Camargue [in French]. *Bull Mus Nat Hist Nat*. 1978;351:19–27.

7 Cancrini G, Yanchang S, Della Torre A, Coluzzi M. Influence of temperature on the larval development of *Dirofilaria repens* in different species of mosquitoes [in Italian]. *Parassitologia*. 1988;30:38.

8 Webber W, Hawking F. Experimental maintenance of *Dirofilaria repens* and *D. Immitis* in dogs. *Exp Parasitol*. 1955;4(2):143–164. https://doi.org/10.1016/0014-4894(55)90007-2.

9 Anyanwu IN, Agbede RIS, Ajanusi OJ, Umoh JU, Ibrahim NDG. The incrimination of *Aedes* (*Stegomyia*) *aegypti* as the vector of *Dirofilaria repens* in Nigeria. *Vet Parasitol*. 2000;92:319–327. https://doi.org/10.1016/s0304-4017(00)00311-3.

10 Genchi C, Kramer L. Subcutaneous dirofilariasis (*Dirofilaria repens*): an infection spreading throughout the old world. *Parasit Vectors*. 2017;10(Suppl. 2):517. https://doi.org/10.1186/s13071-017-2434-8.

11 Pampiglione S, Rivasi F. Human dirofilariasis due to *Dirofilaria* (*Nochtiella*) repens: an update of world literature from 1995 to 2000. *Parassitologia*. 2000;42:231–254.

12 Pampiglione S, Rivasi F, Angeli G, et al. Dirofilariasis due to *Dirofilaria repens* in Italy, an emergent zoonosis: Report of 60 new cases. *Histopathology*. 2001;38:344–354. https://doi.org/10.1046/j.1365-2559.2001.01099.x.

13 Pampiglione S, Rivasi F, Geustinelli A. Dirofilarial human cases in the Old World, attributed to *Dirofilaria immitis*: a critical analysis. *Histopathology*. 2008;53:746–747. https://doi.org/10.1111/j.1365-2559.2008.03197.x.

14 Fedianina LV, Shatova SM, Rakova VM, et al. Microfilaraemia in human dirofilariasis caused by *Dirofilaria repens* Railliet et Henry, 1911. A case report [in Russian]. *Med Parazitol (Mosk)*. 2013;2:3–7.

15 Petrocheilou V, Theodorakis M, Williams J, et al. Microfilaremia from a *Dirofilaria*-like parasite in Greece. Case report. *APMIS*. 1998;106:315–318.

16 Sergiev V, Suprjaga V, Morozov E, LA J. Human dirofilariasis: diagnosis and character of the relationship between causative agent and host. *Med Parasitol Parasit Dis*. 2009;3:3–6.

17 Poppert S, Hodapp M, Krueger A, et al. *Dirofilaria repens* infection and concomitant meningoencephalitis. *Emerg Infect Dis*. 2009;15:1844–1846. https://doi.org/10.3201/eid1511.090936.

18 Negahban S, Daneshbod Y, Atefi S, et al. *Dirofilaria repens* diagnosed by the presence of microfilariae in fine needle aspirates. *Acta Cytol*. 2007;51:567–570. https://doi.org/10.1159/000325796.

19 Simón F, Siles-Lucas M, Morchón R, et al. Human and animal dirofilariasis: the emergence of a zoonotic mosaic. *Clin Microbiol Rev*. 2012;25:507–544. https://doi.org/10.1128/CMR.00012-12.

20 Albanese F, Abramo F, Braglia C, et al. Nodular lesions due to infestation by *Dirofilaria repens* in dogs from Italy. *Vet Dermatol*. 2013;24:255–256. https://doi.org/10.1111/vde.12009.

21 Otranto D, Dantas-Torres F, Brianti E, et al. Vector-borne helminths of dogs and humans in Europe. *Parasit Vectors*. 2013;6:16. https://doi.org/10.1186/1756-3305-6-16.

22 Alsarraf M, Levytska V, Mierzejewska E, et al. Emerging risk of Dirofilaria spp. infection in Northeastern Europe: high prevalence of Dirofilaria repens in sled dog kennels from the Baltic countries. *Sci Rep*. 2021;11(1):1068. https://doi.org/10.1038/s41598-020-80208-1.

23 Diaz JH. Increasing risks of human dirofilariasis in travelers. *J Travel Med*. 2015;22:116–123.

24 Demiaszkiewicz A, Polanczyk G, Pyziel A. The first outbreaks of dogs dirofilariosis caused by *Dirofilaria repens* Railliet et Henry, 1911 in central Poland [in Polish]. *Wiad Parazytol*. 2009;55:367–370.

25 Zarnowska-Prymek H, Cielecka D, Salamatin R. Dirofilariasis – *Dirofilaria repens* – first time described in Polish patients [in Polish]. *Przegl Epidemiol*. 2008;62:547–551.

26 Alsarraf M, Dwużnik-Szarek D, Hildebrand J, et al. Occurrence of Dirofilaria repens in wild carnivores in Poland. *Parasitol Res*. 2023;122(5):1229–1237. https://doi.org/10.1007/s00436-023-07823-5.

[27] Okulewicz A. The impact of global climate change on the spread of parasitic nematodes. *Ann Parasitol*. 2017;63(1):15–20. https://doi.org/10.17420/ap6301.79.

[28] Kondrashin A, Morozova L, Stepanova E, et al. Global Climate Change and Human Dirofilariasis in Russia. *Int J Environ Res Public Health*. 2022;19(5):3096. https://doi.org/10.3390/ijerph19053096.

[29] Alsarraf M, Baneth G, Bogucka-Kocka A, et al. Haplotypes of Dirofilaria repens from Poland and selected countries of Central, North-Eastern Europe and the Middle East: An evaluation on the relation between the genetic diversity and the geographic distribution of the fast-spreading parasite. *Vet Parasitol*. 2023; 315:109882. https://doi.org/10.1016/j.vetpar.2023.109882.

[30] de Vries PJ, Visser LG, Vetter HCM, Muller HP, Polderman AM. Migrating subcutaneous swellings due to dirofilariasis after a visit to the South of France. *Ned Tijdschr Geneeskd*. 2003;147:566–569.

[31] Saied W, Amara K, Bouchoucha S, Khaled S, Mrad K, Nessib MN, et al. An unusual cause of hand nodule: Peri-tendon dirofilariasis [in French]. *Chir Main*. 2010;30:66–68.

[32] Matějů J, Chanová M, Modrý D, et al. *Dirofilaria repens*: emergence of autochthonous human infections in the Czech Republic (case reports). *BMC Infect Dis*. 2016;16:171.

[33] Révész E, Markovics G, Darabos Z, Tóth I, Fok E. *Dirofilaria* in the abdominal cavity. *Magy Seb*. 2008;61:281–284.

[34] Pampiglione S, Rivasi F, Vakalis N. Human pulmonary dirofilariasis: the first case observed in Greece. *Ann Pathol*. 2000;20:626–628.

[35] Abdel-Rahman SM, Mahmoud AE, Galal LAA, Gustinelli A, Pampiglione S. Three new cases of human infection with *Dirofilaria repens*, one pulmonary and two subcutaneous, in the Egyptian governorate of Assiut. *Ann Trop Med Parasitol*. 2008;102:499–507.

[36] Rivasi F, Boldorini R, Criante P, Leutner M, Pampiglione S. Detection of *Dirofilaria* (*Nochtiella*) *repens* DNA by polymerase chain reaction in embedded paraffin tissues from two human pulmonary locations. *APMIS*. 2006;114:567–574.

[37] Gros P, Pierre C, Cavallo JD, Carloz E, Camparo P, Arborio M. Subcutaneous *Dirofilaria repens* dirofilariasis. *Arch Anat Cytol Pathol*. 1996;44:272–277.

[38] Perret-Court A, Coulibaly B, Ranque S, et al. Intradural dirofilariasis mimicking a Langerhans cell histiocytosis tumor. *Pediatr Blood Cancer*. 2009;53:485–487.

[39] Hempel F, Poppert S, Böker T, Schaaf B. 75-year-old woman with symptoms of the eye [in German]. *Dtsch Med Wochenschr*. 2012;137:1641–1642. https://doi.org/10.1055/s-0032-1304889.

[40] Khoramnia R, Wegner A. Images in clinical medicine: subconjunctival *Dirofilaria repens*. *N Engl J Med*. 2010;363:e37. https://doi.org/10.1056/NEJMicm1003006.

[41] Fodor E, Fok E, Maka E, Lukats O, Toth J. Recently recognized cases of ophthalmofilariasis in Hungary. *Eur J Ophthalmol*. 2009;19:675–678. https://doi.org/10.1177/112067210901900424.

[42] Ilyasov B, Kartashev V, Bastrikov N, et al. Thirty cases of human subcutaneous dirofilariasis reported in Rostov-on-Don (southwestern Russian Federation). *Enferm Infecc Microbiol Clin*. 2015;33:233–237. https://doi.org/10.1016/j.eimc.2014.04.002.

[43] Gorezis S, Psilla M, Asproudis I, Peschos D, Papadopoulou C, Stefaniotou M. Intravitreal dirofilariasis: a rare ocular infection. *Orbit*. 2006;25:57–59. https://doi.org/10.1080/01676830500499224.

[44] Kirillov DF, Tarasov AV, Shevchuk EA, Matina ON. Observation of dirofilariosis in the practical work of the otorhinolaryngologist [in Russian]. *Vestn Otorinolaringol*. 2011;5:70–71.

[45] Chopra R, Bhatti SM, Mohan S, Taneja N. *Dirofilaria* in the anterior chamber: a rare occurrence. *Middle East Afr J Ophthalmol*. 2012;19:349–351.

[46] Ermakova LA, Nagorny SA, Krivorotova EY, Pshenichnaya NY, Matina ON. *Dirofilaria repens* in the Russian Federation: current epidemiology, diagnosis, and treatment from a federal reference center perspective. *Int J Infect Dis*. 2014;23:47–52.