Dirofilaria repens in the eyelid: case report of subcutaneous manifestation

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INTRODUCTION

Zoonotic filarial infections in humans are relatively common and mostly due to parasites in the genus Dirofilaria spp., in particular Dirofilaria immitis, D repens, D tenuis, and D ursi. In the United States, D tenuis, a parasite of raccoons, was established to be the primary agent, while in Europe, Middle Eastern countries, Africa, and Southeast Asia, D repens was the most responsible parasite (1). D repens is a natural parasite of carnivores, primarily dogs, foxes, and cats (2). D repens infections are particularly common and often reported from European countries surrounding the Mediterranean, particularly Italy (168 cases), France (53 cases), and Greece (21 cases) (3). Related to the widespread presence of D repens in the usual reservoir (the dog) and of the possible carriers for humans (Culicidi species), it is presumible that dirofilariasis in humans are more frequent than those published in literature (4).

We report a case of eyelid subcutaneous dirofilariasis acquired in Italy. An intact nematode was extracted from the eyelid subcutaneous tissues of a man and was identified as a female D repens.

Case report

A 44-year-old man living in Roma, Italy, came to our Department of Ophthalmology for an ophthalmic evaluation. He had recurrent episodes of itching and swelling of his right upper eyelid. The symptoms started 3 weeks before the visit and persisted without any improvement. The patient had always lived in an urban area and had never traveled out of Italy. Best-corrected visual acuity was 20/20 in the right eye and 20/20 in the left. The intraocular pressure was 16 mmHg in both eyes. In the right eye, the examination revealed a subcutaneous threadlike swelling of the upper eyelid, located parallel and 2 mm above the eyelid margin, without a particular edema of the soft tis-
Dirofilaria repens in the eyelid

Sues of the eyelid (Fig. 1). The ophthalmoscopic fundus examination revealed no lesion. The left eye was normal. A 2–3 mm horizontal skin incision was made where the worm was located without local anaesthetic. A 10 cm long worm was revealed and extracted in toto and preserved in 10% formaldehyde for identification (Fig. 1). Macroscopic morphologic examination was performed on the entire worm, gently rolled out to be measured. The worm was then cut at midbody to carry out microscopic examination on temporary mounts in water. A small part of the worm was cut with a scalpel and the DNA was purified using the DNA IQ System (Promega, Madison, WI). The Internal Transcribed Spacer 1 region (ITS1) was amplified by PCR using the primers ITS1-f (5’-GGTGAACCTGCGGAAGGATC-3’) and IST1-r (5’-GCGAATTGCAGACGCATTGAG-3’), which are able to distinguish filariae at the genus level (5). The PCR was performed in a 30 µL reaction containing 1x GoTaq Green Master Mix (Promega), 20 pmol of each primers, and 5 µL of purified DNA. The PCR assay was performed according to the following cycling conditions: an initial denaturation step at 95°C for 5 min was followed by 35 cycles with denaturation at 95°C for 30 sec, annealing at 58°C for 30 sec, and extension at 72°C for 45 sec. The final extension was undertaken at 72°C for 5 min. The amplification products were analyzed in a 2% agarose gel stained with ethidium bromide. Digestion was performed in a total volume of 30 µL using 5 µL of PCR product and 10 units of the restriction enzyme.
Ase I (Promega) at 37°C for 1 h. The resulting restriction fragments were separated by electrophoresis in a 2% agarose gel.

The female worm, measured with a graduated ruler, was about 113 mm in length (Fig. 2), and 478 µm in width at midbody. The microscopic examination allowed us to observe the presence of cuticular ridges on the body surface, typical of *D repens* species (6).

The PCR on the ITS1 region showed a fragment of about 600 base pair in length consistent with the expected fragment size for *D repens* (Fig. 3) and very similar to that of *D immitis*. The restriction analysis using the Ase I nuclease allowed us to exclude *D immitis* and confirmed the *D repens* hypothesis (Fig. 3).

**DISCUSSION**

In Europe, an increasing number of ocular cases of parasitic infections is reported (7). The major frequency of human cases of dirofilariosis infections could be due to several factors such as an increase of worldwide tourism, international business, and academic visits. In addition, the great number of pets, mainly dogs and cats, and climatic changes such as the greenhouse effect, with a related extension of the Mediterranean weather conditions to the northern countries of Europe, are probably related to an increase in numbers of vectors of parasite, with more possibilities to thrive and spawn infections. The increasing number of diagnosed cases suggests that careful attention must be paid to zoonosis. Moreover, periclar dirofilariasis usually presents as an inflammatory painful mass lesion. The differential diagnosis includes inflammatory pseudotumour, ruptured dermoid cyst, and infective abscess. The case reported here unusually presented as a noninflammatory lid threadlike swelling. Therefore, dirofilariasis should be considered in the differential diagnosis of non-inflammatory mass lesions of the ocular adnexa. Young generations of ophthalmologists and the entire ophthalmic community must be aware of these uncommon presentations of parasitic infestation when they consider infections of ocular adnexa.

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