Recurrent Subcutaneous Human *Dirofilariasis* Due to *Dirofilaria repens* - A Case Report

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Abstract

The first autochthonous *Dirofilaria repens* infection confirmed by molecular techniques in humans from North-Western Romania will be presented. Because subcutaneous human dirofilariasis may go unnoticed due to lack of awareness, medical profession in the region should be informed about the risk of this disease even in patients with no travel history.

Keywords: *Dirofilaria repens*, humans, Romania.

INTRODUCTION

Dirofilaria (D.) repens are filarial nematodes naturally parasitic in dogs, cats and foxes, transmitted by various mosquito vectors. Due to the reported increase of *D. repens* incidence in humans, it is considered an emerging zoonosis in Europe (Genchi *et al.*, 2011a). In Romania, a survey on *Dirofilaria* spp. infection in dogs has been recently published (Ionică *et al.*, 2015), but there is only one report of *D. repens* infection in humans confirmed by molecular diagnosis (Popescu *et al.*, 2012). Human infections typically present as subcutaneous nodules containing an immature worm surrounded by granulomatous tissue, associated with pain, edema, and erythema. Surgical excision of the lesions and affected areas is the treatment of choice. The use of anthelmintic chemotherapy is not routinely recommended after surgery.

MATERIALS AND METHODS

We describe the case of a 65 years old woman, living in Bihor County (North-Western Romania), in an urban area, with no travel history, dog owner, who presented in August 2012 to the Clinic of Infectious Diseases, Cluj Napoca, Romania, for a left shoulder subcutaneous nodule, with 38° Celsius fever and eosinophilia (see table 1).

RESULTS AND DISCUSSION

After surgical excision of the nodule, the histopathologic examination and molecular diagnostic from

the tissue specimen were performed in the Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania. The histopathologic examination revealed the presence of a nematode, identified as *D. repens* on morphological details, surrounded by inflammatory cells, mainly eosinophiles (Figure 1 a, b).

DNA was extracted from the excised tissue using Isolate Genomic DNA extraction Kit (Bioline, UK) and examined by standard PCR for the presence of a specific sequence of *D. repens*, the 12S rDNA gene, as previously described (Lopez *et al.*, 2012). The amplification was performed in Bio-Rad C1000™ Thermal Cycler. The PCR products electrophoresed on agarose gel and examined under UV light confirmed the infection with *D. repens*.

The patient was treated with Albendazole 400 mg/day, 7 days, before the results of histopathologic examination were obtained. No further symptoms were noted until December 2012, when a subcutaneous nodular lesion developed in the left breast (table 1). After surgical removal, an adult nematode was obtained (the adult stage was established on morphological aspects) and identified as *D. repens* using the same procedure performed on the first worm. Due to the recurrent infection, the patient was treated with a single dose of ivermectin 150 µg/kg. No further nodules appeared and eosinophiles were in normal range at the two years follow-up (table 1).

Tab. 1. Clinical and paraclinical follow up of the patient.

	August 2012	September 2012	December 2012	January 2013	February 2013	March 2015
Clinical examination	Left shoulder subcutaneous nodule	Normal	Left breast subcutaneous nodule	Normal	Normal	Normal
Eosinophil count	1284/mm ³	420/mm ³	583/mm ³	274/mm ³	74/mm ³	180/mm ³
Chest Xrays	normal	-	normal	-	-	-
Soft tissue ultrasound	12 mm fluid collection with hyperechoic signal inside in the left deltoid muscle	-	soft tissue edema in the left breast, upper outer quadrant	-	-	-

Fig. 1. (a) Histopathologic section showing *D. repens* surrounded by dense infiltration of inflammatory cells, mainly eosinophiles (H-E stain, 40 X); (b) Morphological details of a *D. repens* worm, cross section (H-E stain, 200 X); H-E=Hematoxylin- Eosin; MC – multilayered cuticle; LM – longitudinal muscles; I – intestine; LC – lateral chords.

Though in most cases of *D. repens* infections in humans the parasite was not able to develop to adult stage, adult worms were identified in almost 14% of the helminths removed from patients in a recently published study (Ermankova *et al.*, 2014). Orihel *et al.* (1997) identified two adult female worms at 10 months interval in a patient; based on maturation of the reproductive system, the authors concluded that both worms came from the same infecting inoculum. Though maturation of both worms was not assessed in our case, we hypothesize that the multiple located disease was most probably the result of the same infecting inoculum, rather than reinfection. An argument against reinfection is the cold season when the second lesion appeared, with no mosquito activity known in the region. Although microfilaremia is exceptional in humans (Genchi *et al.*,

2011b), ivermectin therapy, proposed also by Jelinek *et al.* (1996), could have stopped the development of other third stage larvae inoculated by the infected mosquito, and further appearance of subcutaneous nodules.

CONCLUSIONS

Climatic changes and movement of reservoir dogs have caused an increase in the geographical range of *D. repens* from the endemic southern to the northern regions of Europe (Genchi *et al.*, 2011a). This is the first case of human subcutaneous dirofilariasis confirmed by molecular techniques in North-Western Romania.

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