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Case report
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A Rare Case of Human Dirofilariasis in Požega-Slavonia County, Croatia

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ABSTRACT

Dirofilariasis is an infection caused by parasites of the Dirofilaria genus, which are natural parasites of dogs and cats. Humans are accidental hosts who become infected by the bite of an infected mosquito. The most common vectors are female mosquitoes from Aedes, Anopheles, Culex genera. There are more than 40 described species of Dirofilaria, but human infection is most commonly caused by two species: Dirofilaria repens and Dirofilaria immitis. Human infections are most commonly manifested as subcutaneous/ocular Dirofilariasis (Dirofilaria repens) and pulmonary Dirofilariasis (Dirofilaria immitis). We presented a case of subcutaneous dirofilariasis of the right knee in a 52-year-old patient that manifested as a subcutaneous nodule. He described spending a lot of recreational time near the river Sava. Five years ago, he noticed swelling of his right leg. Two years ago, a subcutaneous nodule appeared in the front part of the knee. Excision in local anesthesia was performed. During the operative procedure, a moving filarial worm was found. The worm was identified as Dirofilaria spp. at the Croatian Institute of Public Health Zagreb.

Key words: *dirofilariasis, human, helminthiasis, parasitic diseases, nematode infections*

Introduction

Dirofilariasis is a parasitosis caused by a roundworm from the genus *Dirofilaria*. Their size varies from a few millimeters to a few centimeters. They are whitish in color and have a firm, elastic structure. Their body is covered with a cuticle consisting of collagen and small amounts of carbohydrates and lipids[1]. More than 40 species of *Dirofilaria* have been described, but in humans, infections are most often caused by two species: *Dirofilaria repens* and *Dirofilaria immitis*[2]. The natural hosts of parasites are usually dogs and cats. Humans are accidental hosts through the bite of an infected mosquito[3]. The most common vectors are female mosquitoes from the genera: *Aedes*, *Anopheles*, *Culex*. Human Infections are most often manifested as subcutaneous/ocular dirofilariasis (*Dirofilaria repens*) and pulmonary dirofilariasis (*Dirofilaria immitis*). Subcutaneous dirofilariasis is frequently presented as subcutaneous nodule about 1 cm in diameter. The symptoms are very mild, non-specific and remain unrecognized. They are located on open parts of the body (face, neck, arms, legs)[4]. Ocular dirofilariasis mostly occurs as conjunctivitis and is easily diagnosed and treated. However, if it is not recognized in time, the parasite can migrate into the deeper structures of the eye and cause complications (glaucoma, retinal detachment, visual impairment etc.)[5,6]. In the Republic of Croatia, 30 cases of roundworm disease have been described[7–21]. Ten of them have been documented in Slavonia County.

Case Report

We describe a case of subcutaneous dirofilariasis in the area of the right knee in a 52-year-old man without a

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history of any serious disease. He had not traveled outside of Croatia in the last few months before the first symptoms appeared. He had no pets. The first symptoms appeared five years ago in the form of migrating oedema of the right lower leg with slight pain and redness of the skin. He visited his physician several times, but the appearance of oedema was never fully resolved. During that period, he performed routine tests several times, but they were within normal values. Two years ago, he noticed a painless nodule on the anterior part of his right knee. He described spending a lot of recreational time near the Sava River, where he is exposed to a large number of mosquitoes. On physical examination, a painless, well-demarcated, subcutaneous nodule was found in his right knee, about 1 cm in diameter. There were no local signs of inflammation. Neurovascular examination showed no abnormalities. X-ray examination, blood and serological tests were not performed. Excision in local anaesthesia was done. During the operative procedure, a moving, filarial, 5 cm long worm was found. The nodule was sent to the pathology department and the worm to microbiological laboratory. The histopathological report corresponded to a reactive change to the parasite (Figure 1). The worm was identified as *Dirofilaria spp*. at the Croatian Institute of Public Health Zagreb (Figure 2). Chemotherapy was not performed because is not recommended for human dirofilariasis. The patient was followed up for 1 month, and no additional symptoms were noted (Figure 3).

Discussion and Conclusion

Human dirofilariasis is endemic in Mediterranean countries (Spain, France, Italy, Greece)[4,22–25]. Subcutaneous dirofilariasis mostly presents as a subcutaneous nodule on the upper and lower body parts. The nodule is usually painless with elastic consistency and erythema. It grows gradually over a period of months or years. Ocular dirofilariasis occurs in ocular region (eyelids, subconjunctival and orbital zone, intravitreous tissue). The most often symptoms are: swelling of the upper or lower eyelid, conjunctivitis, palpebral ptosis and moderate ocular discomfort. However, if the symptoms remain unrecognized, the disease can have serious consequences (retinal detachment, glaucoma, crystalline lens, damaged vision, blindness). Pulmonary dirofilariasis is most often presented by

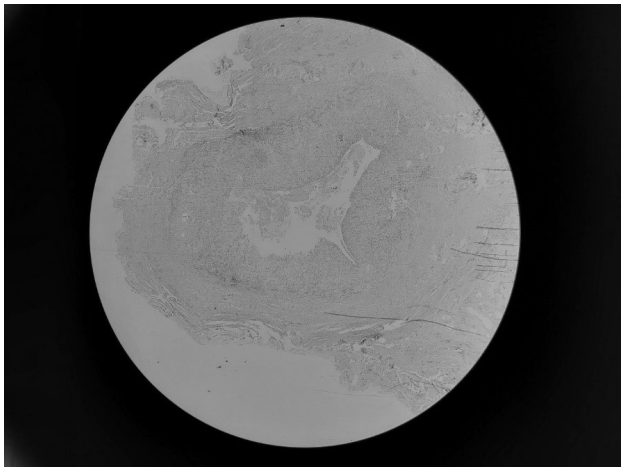

Fig 1. Histopathological report of subcutaneous nodule: round piece of tissue, histologically composed of fat and connective tissue with a central pseudocyst, without epithelium, lined with histiocytes, granulocytes, and mononuclear cells.

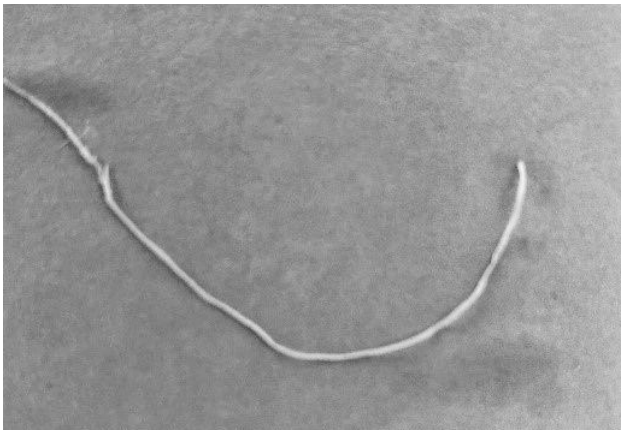

Fig. 2. Native image of an extirpated roundworm Dirofilaria spp.

Fig. 3. The arrow shows the postoperative scar where the roundworm was extirpated.

the appearance of pulmonary nodules on the chest x-ray images. Symptoms are nonspecific and include dyspnea, coughing with or without thoracic pain, malaise, fever, purulent or haemoptoic sputum, etc. Pulmonary nodules are frequently misdiagnosed as a malignant lesion. *Dirofilaria* larvae can occlude small branches of the pulmonary artery and cause embolism and tissue necrosis. It is known that pulmonary nodules are most often localized in the right lung in peripheral locations[26]. *Dirofilaria spp.* is animal and human parasite. Humans are accidental hosts in which the parasite rarely reach sexual maturity but induce local inflammation and granuloma formation. Dirofilariasis is usually diagnosed by the finding of adult worms in biopsy specimens of subcutaneous nodules or removed from the eye or by the finding of the coin lesions on chest X-rays. The diagnosis is based on macro- and micro– features of the parasite. Molecular and immunological methods are also available but are not routinely used. In treatment, surgical procedures are usually used, due to the suspicion of a malignant origin of the nodule or the presence of worms in ocular locations. Chemotherapy is not recommended for human dirofilariasis. The number of cases of human dirofilariasis is increasing in the world and in Croatia. The most important factors for dirofilariasis expansion are global warming and global migration, as the number of vectors (mosquitoes) increases. To date, 30 cases of human dirofilariasis have been described in Croatia, but the actual number is probably higher because reporting this disease in Croatia is not mandatory. Clinical importance of this parasitosis is due to commonly misdiagnosed as tumor or some granulomatous lesion which can lead to unnecessary diagnostic tests and procedures.

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RIJETKI SLUČAJ HUMANE DIROFILARIOZE U POŽEŠKO- SLAVONSKOJ ŽUPANIJI

S A Ž E T A K

Dirofilarioza je infekcija uzrokovana parazitima iz roda *Dirofilaria* čiji su prirodni domaćini psi i mačke. Ljudi su slučajni domaćini koji se zaraze ubodom zaraženog komarca. Najčešći prijenosnici su ženke komaraca iz rodova: *Aedes*, *Anopheles*, *Culex*. Opisano je preko četrdeset vrsta Dirofilarija, ali kod ljudi najčešće infekcije uzrokuju dvije vrste: *Dirofilaria repens* i *Dirofilaria immitis*. Infekcije se najčešće očituju kao potkožna/okularna dirofilarioza (*Dirofilaria repens*) i plućna dirofilarioza (*Dirofilaria immitis*). Prikazali smo slučaj potkožne dirofilarioze desnog koljena u 52-godišnjeg muškarca koja se manifestirala potkožnom oteklinom u području desnog koljena. Pacijent rekreativno često boravi u blizini rijeke Save. Prije pet godina opazio je oticanje i crvenilo desne potkoljenice. Prije dvije godine pojavila se potkožna oteklina s prednje strane koljena. U lokalnoj anesteziji učinjena je ekscizija potkožne kvržice prilikom čega je izašla filiformna migrirajuća tvorba koja je identificirana kao *Dirofilaria spp* na Hrvatskom zavodu za javno zdravstvo u Zagrebu.