

## CASE REPORT

# Human *Dirofilariasis* in Latvia – the First Case in Surgical Practice

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**Summary**

Though dirofilariasis in humans occurs rarely, the number of cases due to *Dirofilaria repens* has been increasing worldwide over the last decade. Climatic changes and animal migration extend geographic area of human dirofilariasis, now including Latvia. The diagnosis is based on histopathological features. Surgical excision is the only curative treatment. Practitioners should bear in mind the possibility of human dirofilariasis in residents of Latvia.

**Key words:** human dirofilariasis, *Dirofilaria repens*, surgical disease, out-patient surgery.

**AIM OF THE DEMONSTRATION**

Aim of the demonstration is to show a case of previously unknown surgical disease in residents of Latvia that can be encountered in out-patient surgery.

**CASE REPORT**

The patient, 32-years-old woman, attended surgeon with complaints about continuous subfebrile temperature and discomfort in the lower abdomen, where a subcutaneous nodule was found by the patient herself. Her past history revealed no travel outside of Latvia for 4 years. About 9 months before this visit the patient suffered from swelling, redness and induration in her right shank accompanied by febrile temperature during 5 days. After 2 weeks of quiescence new inflammation around her right knee appeared, and then gradually shifted to the right thigh, the right gluteus, reaching the lower abdomen. When the induration in the abdominal wall disappeared, the mass was found.

Clinical examination showed a sensitive pea-sized nodule located in the subcutaneous tissue in the middle of hypogastric region. No redness or other visual changes of the skin were present. Fluctuation was absent as well. After incision, a grey capsule (measuring 0.5x0.7 cm) was revealed deeply in subcutaneous adipose tissue. The capsule ruptured spontaneously during excision and worm structures appeared (Fig.1).

The operation material was submitted for laboratory investigation. At gross examination soft tissue fragments were found measuring 2.2x1x0.5cm. White thread-like structures, measuring up to 5 cm in length and 0.1 cm in diameter were grossly visible as well. The longest thread-like structure was sent for specific evaluation in the parasitology laboratory. Other thread-like fragments measuring up to 2 cm in length were submitted for histology. The tissue material was processed in the tissue processor, embedded in the paraplast, cut into 4 micron thick samples on the slides and stained by haematoxylin-eosin and PAS. Microscopic investigation

showed fat tissues with foci of granulations containing parasite fragments (Fig.2). The worm was surrounded by infiltrate composed by epithelioid cells, eosinophils, lymphocytes, plasma cells and macrophages. The transverse section of parasite showed thick multilayered cuticle with longitudinal ridges on external part, well developed longitudinal muscle layer on inner part and the internal organs of parasite (Fig.2). According to the specific morphological outlook *Dirofilaria repens* was diagnosed, which was verified by experts in parasitology. One week after excision the patient had no complaints and the body temperature was within normal range.

**DISCUSSION**

Human dirofilariasis due to *Dirofilaria repens* is a zoonosis ordinarily affecting the dogs and, more rarely, cats. It is transmitted by *Culicidae* mosquitoes, present only in the Old World. Endemic foci of *D. repens* are located in Southern and Eastern Europe, Asia Minor, Central Asia and Sri Lanka, with the highest prevalence in Italy (Pampiglione *et al.*, 1995). The increasing number of new cases suggest that human dirofilariasis is an emergent zoonosis (Pampiglione *et al.*, 2001). Currently, human dirofilariasis is considered as an emerging disease in the Rostov Region in Southern Russia (Kramer *et al.*, 2007; Kartashev *et al.*, 2011). Two cases of human subcutaneous dirofilariasis are reported in Slovakia (Ondriska *et al.*, 2010).

An increase in the geographical range of dirofilariasis and the risk of human disease may be due to various factors: climatic changes, spreading of canine dirofilariasis, an increase of pet travels, and improvement in the network of pathological services. A growing degree day-based forecast model has been developed to predict the occurrence. The model is based on evidence that there is a threshold of 14 °C below which *Dirofilaria* development will not proceed in mosquitoes, there is a requirement of 130 growing degree-days for larvae to reach infectivity, and there is a maximum life expectancy

of 30 days for a mosquito vector (*Genchi et al.*, 2011). The age of the patients varied from 4 months to 100 years, with no difference in incidence between sexes (Pampiglione and Rivasi, 2000). The nematodes penetrate the body of the host in the form of infecting larvae by the bite of the mosquito. The larvae migrate through the dermis to the subcutaneous tissue, where they mature either in situ or after migration to other sites. The parasite appears most frequently in the upper half of the body, particularly in the head, ocular region and upper limbs (Pampiglione *et al.*, 2001; Kramer *et al.*, 2007). It is hypothesized, that at the point where they stop, they evoke an acute inflammatory reaction leading to formation granulation tissue that blocks the nematode and causes its death (Pampiglione *et al.*, 2001). The diagnosis usually is based on histopathological features, but immunohistochemical, serological and molecular methods are more sensitive and specific (Pampiglione *et al.*, 2001; Kartashev *et al.*, 2011; Ondriska *et al.*, 2010). As the rate of human dirofilariasis increases in proportion to canine infection (Kartashev *et al.*, 2011), the measures regarding prophylaxis in dogs and control of mosquito populations may decrease the spread of *D. repens*.

Thus, a new entity of surgical pathology has emerged in Latvia. The surgeons and general physicians should be aware of dirofilariasis as it can be encountered in out-patient surgical practice even in residents of Latvia without recent travelling experience. The treatment of dirofilariasis as well as the organization of diagnostics has entered the daily work of surgeon.

**Conflict of interest:** None

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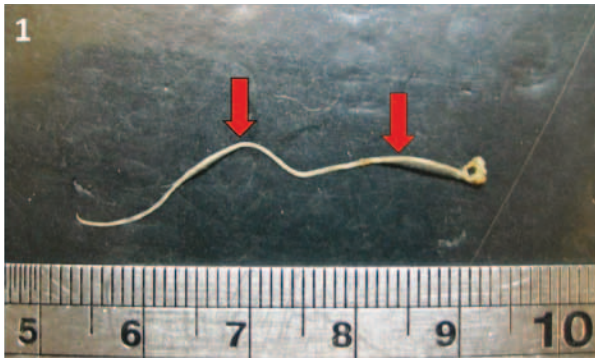


Fig. 1. The removed *Dirofilaria repens* in native specimen. The worm is highlighted by arrows.

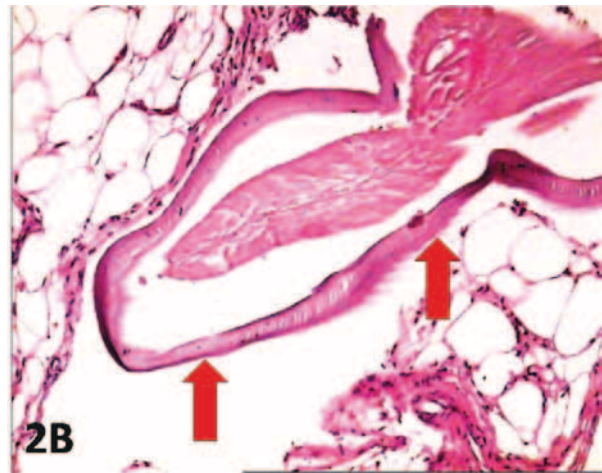
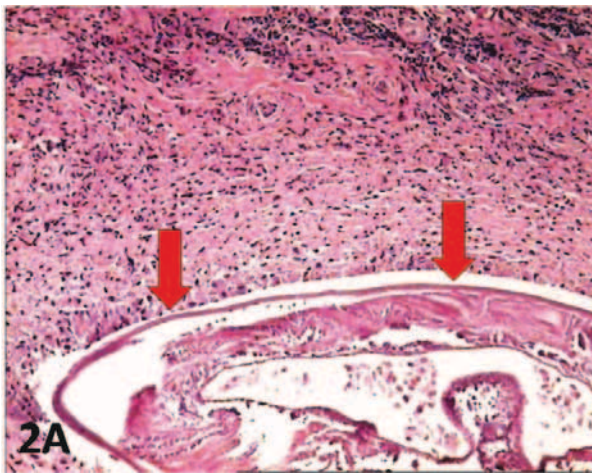


Fig. 2. *Dirofilaria repens* in tissues. Note the granulation tissue in 2A as well as the internal structure of the parasite in 2B. The worm is highlighted by arrows. Haematoxylin-eosin, original magnification 50x (2A) and 100x (2B).