

Case Report

Ocular and subcutaneous dirofilariasis in a Sri Lankan infant: an environmental hazard caused by dogs and mosquitoes

Manouri P. Senanayake¹, M. L. M. Infaq², S. G. S. Adikaram², P. V. Udagama³

Departments of ¹Paediatrics and ³Zoology, University of Colombo, and ²Department of Paediatrics, Lady Ridgeway Hospital, Colombo, Sri Lanka

An 11-month-old infant presented with a subcutaneous nodule in the right cheek which was found by ultrasonography to be a worm. Following treatment with di-ethylcarbamazine, a worm emerged from the left upper eyelid which was confirmed to be *Dirofilaria repens*. Dirofilariasis usually manifests as a single lesion and is rare in infants.

Keywords: *Dirofilaria repens*, Ocular dirofilariasis, Subcutaneous dirofilariasis, Infant, Dog and mosquito populations

Introduction

Human dirofilariasis is caused by accidental transmission of the filarial nematode *Dirofilaria repens* from the definitive host (dog) to man, via mosquitoes. Many Asian and African countries are endemic for *D. repens* and Sri Lanka has reported an infection rate of almost 60% in dogs.^{1,2} Dirofilariasis is an emerging zoonotic infection in Europe.³⁻⁵ A PubMed search for *D. repens* in children found infection in infants to be very rare but the youngest case reported was 4 months old.^{1,6-8} Human dirofilariasis is usually a single lesion caused by a single worm. An infant with two lesions caused by *D. repens*, one in the eye and the other in subcutaneous tissue, is described.

Case Report

An 11-month-old previously healthy boy from Nugegoda, a suburb of Colombo, the capital city of Sri Lanka, presented to the Lady Ridgeway Children's Hospital, Colombo with a non-tender, non-pruritic, well defined subcutaneous nodule on the right cheek for the past week, and low-grade fever without constitutional symptoms. His birth, growth and development were normal. The family kept no pets but there were many stray dogs in the neighbourhood.

On examination, he was a well cared for infant with no other subcutaneous nodules, lymphadenopathy, hepatomegaly or splenomegaly. Results of systemic examination were normal. On the following day, however, the left eye was red and itchy and there was non-purulent conjunctivitis.

Investigations. Haemoglobin was 12 g/dl and total leucocyte count $18.4 \times 10^9/L$ [neutrophils 45%, lymphocytes 33%, eosinophils 22% (absolute eosinophilia $4.048 \times 10^9/L$)]. Erythrocyte sedimentation rate was 12 mm (1st hour) and C-reactive protein <6 mg/dl (<6.0). Peripheral blood smears showed eosinophilia but no microfilariae were detected.

Ultrasonography of the right cheek showed a hypo-echoic lesion, 9.5×6.5 cm, in the deep subcutaneous tissue adjacent to the medial end of the right masseter muscle with a worm within it. After 2 days of di-ethylcarbamazine (3 mg/kg/day), a live, actively motile, white-coloured worm $10.5 \times 0.5-1$ mm emerged from under the left upper eyelid. The nematode was identified as an adult female and microscopy demonstrated the characteristic cuticle with longitudinal ridges of *D. repens* (Figs 1 and 2). Ophthalmic assessment shortly after the worm was extruded found inflamed palpebral conjunctiva, normal lens and normal anterior and posterior chambers. The child was visually alert and was able to see and pick up very small objects. The conjunctivitis resolved within 2 days.

After 14 days of di-ethylcarbamazine therapy, repeat ultrasonography showed persistence of the worm in the subcutaneous nodule. With treatment, however, the subcutaneous nodule reduced in size and 6 weeks later the nodule was barely palpable and the blood eosinophilia had resolved.

Discussion

The life cycle of *D. repens* requires both a vertebral host and an arthropod to complete its five stages. The adult worm releases large numbers of microfilariae

Correspondence to: M Senanayake, Department of Paediatrics, Faculty of Medicine, University of Colombo, PO Box 271, Kynsey Road, Colombo 08, Sri Lanka. Email: manouri.senanayake@gmail.com / paedcmb@gmail.com



Figure 1 Adult female nematode (length 10.5 cm) recovered from the infant's left eye

into the bloodstream of the definitive host (the dog) which, when ingested by a mosquito, mature into different larval stages. When a mosquito takes a blood meal 10–16 days later, the infective larvae (the third-stage larvae) are inoculated back into the vertebral host and the adult stage is reached. When accidental human infection occurs, the larvae develop into adult worms in subcutaneous tissue but the life-cycle cannot be completed. The adult female worm can be as long as 25–30 cm; the males are shorter.

Human infection is mostly in adults. No occupational risk has been described but infection in travellers has been documented.^{9,10} Lesions are typically single and present as subcutaneous nodules. Common sites are around the eye and on genitalia or limbs. There may be associated fever and allergic symptoms. The worm may migrate or, if surrounded by fibrous tissue, degenerate and calcify. Lesions at multiple sites (the right cheek and left eye in this case) suggest multiple inoculations.

Treatment with di-ethylcarbamazine or ivermectin is recommended to eliminate clinically silent worms, although there is no evidence of efficacy.¹¹ In this case, for cosmetic reasons, the lesion in the cheek was not excised. There was a good response to 6 weeks of treatment with di-ethylcarbamazine therapy.

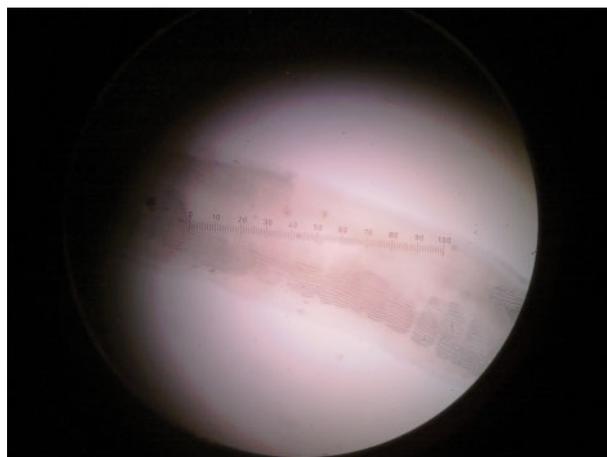


Figure 2 Cuticle of *D. repens* (magnification 10 × 10) showing characteristic longitudinal ridges (1 unit of scale = 0.01 mm)

References

- 1 Dissanaiké AS, Abeyewickreme W, Wijesundera M de S, Weerasooriya MV, Ismail MM. Human dirofilariasis caused by *Dirofilaria (Nochtiella) repens* in Sri Lanka. *Parasitologia*. 1997;39:375–82.
- 2 Permi HS, Veena S, Prasad HLK, Kumar YS, Mohan R, Shetty KJ. Subcutaneous human dirofilariasis due to *Dirofilaria repens*: report of two cases. *J Glob Infect Dis*. 2011;3:199–201.
- 3 Pampiglione S, Rivasi F, Angeli G, Boldorini R, Incensati RM, Pastormerlo M. Dirofilariasis due to *Dirofilaria repens* in Italy, an emergent zoonosis: report of 60 new cases. *Histopathology*. 2001;38:344–54.
- 4 Beden U, Hokelek M, Acici M, Umur S, Gungor I, Sullu Y. A case of orbital dirofilariasis in Northern Turkey. *Ophthal Plast Reconstr Surg*. 2007;23:329–31.
- 5 Genchi C, Rinaldi L, Mortarino M, Genchi M, Cringoli G. Climate and dirofilaria infection in Europe. *Vet Parasitol*. 2009;163:286–92.
- 6 Font RL, Neafie RC, Perry HD. Subcutaneous dirofilariasis of the eyelid and ocular adnexa — report of six cases. *Arch Ophthalmol*. 1980;98:1079.
- 7 Fernando D. Intra-ocular nematode worms: rare but important. *Ceylon Med J*. 2005;50:141–3.
- 8 Pampiglione S, Rivasi E. Human dirofilariasis due to *Dirofilaria (Nochtiella) repens*: an update of world literature from 1995 to 2000. *Parasitologia*. 2000;42:231–54.
- 9 Poppart S, Hodapp M, Kruger A, Hegasy G, Niesen W. Dirofilariasis repens and concomitant meningoencephalitis. *Emerg Infect Dis*. 2009;15:1844–6.
- 10 Khoramnia R, Wegner A. Subconjunctival *Dirofilaria repens*. *N Engl J Med*. 2010;363:e37.
- 11 Jelinek T, Schulte-Hillen J, Loscher T. Human dirofilariasis. *Int J Dermatol*. 1996;35:872.