

and aggressive protocols in oncology and transplant units, the incidence of infections caused by unusual organisms such as *Pr. wick-erhamii* is bound to increase.

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An Imported Case of Ophthalmomyiasis Interna Posterior in the Netherlands Caused by a Larva of the Reindeer Warble Fly

COLLEAGUES—In October 1986, a 5-year-old girl was referred to the Eye Hospital in Rotterdam for unexplained endophthalmitis of the left eye. The adopted child was of Indonesian origin but had lived in a province town near Rotterdam since the age of 1 year. For the previous few weeks, the left eye had shown increasing inflammation, with redness, swelling, and pain. The further medical history was unspecific. Upon examination, the eye was capable only of light perception. There was hypopyon; the vitreous humor was yellowish with many cells and hemorrhages. Sonography revealed an unidentified mass in front of the posterior pole.

A diagnostic vitrectomy revealed total retinal detachment and, more surprisingly, an 8-mm-long larva in the posterior chamber, which was extracted in toto (figure 1). The retinal detachment was treated with injection of silicon oil; after 2 weeks, the retina seemed to heal but further follow-up showed the eye had permanently lost its function.

Myiasis of the eye, or ophthalmomyiasis, may be caused by a variety of flies [1]; imported cases are rarely seen in northern or western Europe. In some areas in eastern Europe and particularly northern Africa, external ophthalmomyiasis caused by the sheep nasal botfly *Oestrus ovis* is common in humans [2]. Occasional cases have been described in which the infection was contracted in southern Europe, such as on the beach of Nice, France [3], or on the Greek isle of Crete [4].

Ophthalmomyiasis interna is even less common. Destructive endophthalmitis due to larvae of the cattle warble flies *Hypoderma bovis* and *Hypoderma lienatum* has been described in Europe and the Netherlands some 30 years ago [5]. On external examination, the larva from our patient indeed resembled closely the first-stage larva



Figure 1. Top: *Oedomagaena tarandii* larva after extraction; arrowhead indicates cephalic end. Bottom: enlargement of cephalic end with cuticular spines and oral hooklets (extremities of cerebropharyngeal skeleton).

of *Hypoderma* species: diaphanous and smooth, sparsely covered with minute spines that were more dense at the extremities, typical spiracles, and small, crescent-shaped oral hooklets on the cephalic extremity. However, both species are now eradicated from the Netherlands and most of northern Europe.

The child had not recently sojourned in southern Europe, where cattle warble flies are still endemic, but the family had spent its sum-

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mer holiday in North Sweden, where another warble fly, *Oedomagena tarandii*, is still an important pest of reindeer [6]. In recent years, a few cases of ophthalmomyiasis interna posterior due to larvae of this fly have been described in northern Scandinavia [7, 8]. The differentiation with *Hypoderma* larvae is possible only by comparison of the cerebropharyngeal skeleton [7]. In the larva from this patient, the pharyngeal sclerites were straight and slender, and the curved oral hooklets had their anterior ends directed forward, with a blunt recurved tooth near their sharp ends. These characteristics allowed us to identify the larva as a first-stage larva of *Oedomagena tarandii*.

Syrdalen et al. [7] reviewed the reported cases of ophthalmomyiasis interna posterior in various parts of the world. In 19 documented cases after 1934, 4 were caused by *H. bovis*, 1 each by *Oestrus ovis*, *Rhinoestrus purpureus*, and a *Cuterebra* species, and others by unidentified larvae. The authors added a case caused by *Oedomagena tarandii*, and a few years later, Syrdalen and Stenkula [8] added 5 more, estimating that the infection is probably more common but often not diagnosed as such.

Infection with *Oedomagena tarandii* is contracted in the summer, when the flies deposit their eggs, usually in the underfur of the reindeer. The larva hatches in 4–7 days and penetrates the skin of the animal. It forms a tumorous "warble" and undergoes three moltings. The mature larva falls to the ground in April or May and pupates; the adult fly emerges in June or July [9]. In the human cases, the eggs were probably deposited on the eyebrows or the eyelids. The larva probably penetrates the sclera, then the retina, and is trapped in the vitreous humor. The symptoms start between August and October, with conjunctivitis evolving to iridocyclitis and uveitis. In cases with severe destruction, the prognosis is poor.

The patient presented here is the sixth confirmed case of human ophthalmomyiasis interna caused by *Oedomagena tarandii*, and the first such case outside Scandinavia. Probably many cases are never diagnosed as such [8]; the diagnosis should be considered in all pa-

tients with unexplained uveitis who have sojourned in an arctic area. The bitter irony of this case, an Indonesian adopted child losing eyesight due to an unusual Arctic parasite, was to some extent softened by the identification of the larva. Proof of the origin of the larva entitled the child to a travel insurance indemnity; the form of the cerebropharyngeal skeleton was thus of more than academic interest.

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