

## Case Report

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# Ophthalmomyiasis Externa due to *Oestrus ovis* Larvae: A Case Report

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## Keywords

Ophthalmomyiasis · Larvae · *Oestrus ovis*

## Abstract

A 23-year-old female presented with redness, itchiness, tearing, and foreign body sensation in her right eye after spending her holiday in Egypt. Slit lamp examination revealed about 15 mobile, whitish maggots that were microbiologically classified as *Oestrus ovis* larvae. All parasites could be removed without subsequent complications.

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## Introduction

Ophthalmomyiasis is referred to as infestation of the eye by larvae forms of flies of the order Diptera. It may be caused by various types of species [1], with *Oestrus ovis* (sheep botfly) being one of the most common species for ophthalmomyiasis externa [2]. This type of parasite normally deposits their larvae into the nostrils of sheep or goats to complete their larval cycle before they fall to the ground and grow adult. People working with these host animals or spending their time close by are more prone to infestation, which can happen either by contaminated hands or direct encounter with the adult female fly. However, the condition is not only reported in rural areas with farmers or animal husbandry but also by accidental encounter in people from all over the world and even urban areas without direct or close contact to animals [3–8]. We present the case of a 23-year-old female with ophthalmomyiasis externa due to *O. ovis* larvae observed in Germany. Written informed consent was obtained from the patient.

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## Case Report

A 23-year-old woman presented to our clinic experiencing slight redness, itchiness, foreign body sensation, and tearing in her right eye for 2 days. Besides this, she did not notice anything unusual. Her main concern was to rule out any kind of infection.

The patient reported to have returned recently from a 2-week trip to Egypt where she took a ferry ride on the Nile. On this occasion, something, most likely a fly, hit her right eye which caused discomfort and a slight redness. Other potential causes for the symptoms, especially direct contact to animals, were denied. With respect to the limited treatment options on board of the ferry, she immediately rinsed her eye, however, with Nile water. Afterward, the redness seemed to fade, though the eye started to itch increasingly. She did not seek medical advice during her remaining holidays and visited the outpatient department of our clinic after her return flight which was 2 days after the incident.

Distance-corrected visual acuity was 20/20 in both eyes. Slit lamp examination of the right eye revealed a discrete state of irritation of the conjunctiva with slight conjunctival hyperemia. There were about 15 motile larvae of 1–1.5 mm length, mainly within the lower fornix area (Fig. 1), but were also found under the upper eyelid after ectropionization. The larvae were light colored, slightly transparent, and had an elongated body with regular transverse segmentation and a dark head with two hook-shaped mouthparts. Their body also showed lengthwise a whitish band, probably the digestive tract. Further examination of the anterior and posterior sections of the eye, including nasolacrimal ducts, was without findings, as was the left eye.

We placed the larvae within a drop of balanced salt solution in a petri dish and sent it to a specialized microbiological laboratory at the University of Heidelberg. They confirmed our suspected diagnosis of ophthalmomyiasis and specified it as *O. ovis*. The microscopic images are shown in Figure 2.

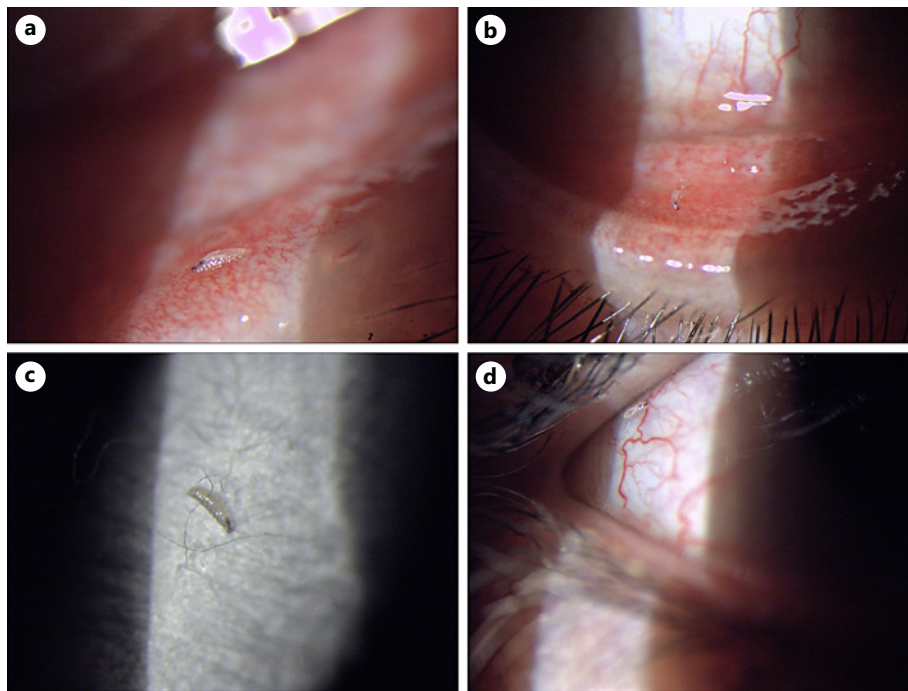
All visible larvae were carefully removed with sterile cotton swab sticks or tweezers under topical anesthesia. Afterward, we used Desmarres eyelid retractor and double ectropionization to rinse the eye with balanced salt solution multiple times and with diluted povidone-iodine solution. Observing the removed larvae, it seemed that they would only continue to be viable within a moist environment.

As a medical treatment, we prescribed topical antibiotics (ofloxacin four times a day). The follow-up examination on the next day showed no remaining or additional larvae within the initially affected or in the other eye. To be on the safe side, we decided to rinse the eye again with povidone iodine and continued with the topical antibiotics for two more days. Three days after the first presentation, the young woman was without symptoms and the slit lamp examination showed an irritation-free and also otherwise unremarkable eye.

## Discussion

While encounters with flies into an eye happen quite regularly, infestation of their larvae in the ocular structures is rare, especially outside tropical or mild-climate regions or in urban areas [1]. Cases of ophthalmomyiasis can be divided into external or internal, where external is more common and refers to the infestation of the ocular surface [9]. Ophthalmomyiasis interna may cause severe damage to the retinal and orbital structures [1], whereas external ophthalmomyiasis presents mostly with discomfort, itching, foreign body sensation, conjunctivitis, and epiphora. Early diagnosis and treatment are of great importance in both cases.

First-line treatment of ophthalmomyiasis externa is the mechanical removal of the larvae with a wet cotton swab or forceps, associated with topical antibiotics. As the larvae are



**Fig. 1.** a–d Slit lamp images of the larvae.

photophobic [9], ectropionization with a thorough check of the fornices is mandatory for complete removal. Due to the hook-shaped mouthparts of *O. ovis* in their first instar which can cling to the conjunctiva quite strongly, removal might be challenging and merely rinsing the eye is not sufficient [10]. Furthermore, the small and shady larvae can easily be overlooked which makes a thorough follow-up examination advisable. But in general, after the complete removal of an external infestation, the eye has fully recovered within a few days [2, 4].

Outside of Mediterranean or tropical regions, the occurrence of ophthalmomyiasis is rare and mostly seen in travelers returning from such countries. Furthermore, the symptoms of conjunctivitis, itchiness, and foreign body sensation are likely to lead to misdiagnosis [11]. There is agreement within the published literature on the necessity of reporting cases as awareness needs to be increased. Naujokaitis et al. [4] just recently published a case of ophthalmomyiasis externa in a German patient who did not travel abroad for the last 2 years. Moreover, they present an overview of those rare cases observed in Germany over a few decades (travelers and nontravelers) and raise the question whether climate change might also change the incidence of ophthalmomyiasis. Pupic-Bakrac et al. [12] published 2 cases from Croatia in 2020 and believe that global warming and climate change may increase the prevalence of *O. ovis*. In the same year, Hartmannova et al. [5] reported a case from Czech Republic, where ophthalmomyiasis is only rarely seen in ophthalmology departments. Atypically, their patient presented to the clinic only 7 weeks after a possible contact while traveling Greece and more than 20 larvae were found. Most reports state that patients present to the clinic within a few days after the encounter as the symptoms are discomforting and might also be somewhat worrying.

To our knowledge, there is no sufficient listing of cases of ophthalmomyiasis from which one could conclude an increase in occurrences outside typical regions. However, Bernhardt et al. [13] performed a literature analysis on myiasis in humans which points out that climate



**Fig. 2.** a–c Microscopic images of *O. ovis*.

change indeed increases fly population in (Western) Europe, leading to more infestations in humans. This suggests that *O. ovis* strikes might also increase and are in agreement with findings from the early 2000, where *O. ovis* strikes were reported to be connected to warmer temperatures [14]. Therefore, with extended warm periods in Europe, ophthalmologists need to be aware of detecting and treating ophthalmomyiasis externa.

### Conclusion

Ophthalmomyiasis – even though it is rare in nontropical and urban regions – should be considered a differential diagnosis when patients present with symptoms similar to classic conjunctivitis, especially when they have recently traveled to rural areas and report potential contact of eyes with flies.

### Statement of Ethics

This case report adhered to the tenets of the Declaration of Helsinki and the patient gave their written informed consent to publish their case. Ethical approval is not required for this case report in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

### Conflict of Interest Statement

Authors have no financial or proprietary interest in any material or method mentioned.

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### Author Contributions

Both authors (Jens Schrecker and Rebecca Ahnert) provided substantial contributions to conception, design, and interpretation. They both drafted the article and critically revised it for important intellectual content. They both approved the final version to be published.

## Data Availability Statement

All data related to this case report are included in the article. Further inquiries must be directed to the corresponding author.

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