External Ophthalmomyiasis Caused by Sheep Botfly (Oestrus Ovis) Larva

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External Ophthalmomyiasis is the infestation of external ocular tissues (eyelids, conjunctiva, lacrimal ducts) of man by fly larvae. Ophthalmic myiasis has been reported from various world regions. In this study, we present the clinical manifestations of ophthalmomyiasis caused by first-stage larvae of Oestrus ovis in four patients from rural areas during the period of January to April. All patients presented with symptoms like viral or allergic conjunctivitis after history of something falling in the eyes during outdoor work. Two of the patients were from Ahir caste (shepherds), in close contact with sheep and goat. The larvae were observed in the bulbar conjunctiva and following their removal, the symptoms of eye inflammation improved in a few hours/days with topical antibiotics and steroids eye drops. As the larvae are small, translucent and quickly avoiding the slit lamp beam, they can be easily overlooked on routine examination.

We should suspect larval conjunctivitis in rural areas, especially during spring and summer, in patients presenting with viral or allergic conjunctivitis like picture following history of something falling into the eye.

Introduction
External ophthalmomyiasis is deposition of fly larvae confined to conjunctiva, eyelid, and lacrimal ducts. Ophthalmomyiasis is not uncommon but underestimated in rural areas. Few cases have been published in the past but it is still frequently misdiagnosed as viral or allergic Conjunctivitis.

We reported clinical manifestations of ophthalmic myiasis in four patients. The clinical picture is that of a viral or allergic conjunctivitis with tearing, foreign body sensation and itching of the eye. The aim to report this case series is to create awareness about it amongst the ophthalmologist working in rural areas because larvae can be easily overlooked on routine examination as they are small, translucent and quickly avoid the slit lamp beam.

Case History
We observed four cases of external ophthalmomyiasis from Jan. 09 to April 09. Each patient was examined thoroughly and was asked, in detail, about the history and, in particular, symptoms related to the development of myiasis. Diagnosis of external ophthalmomyiasis was made by direct visualization of the larvae, using slit lamp. The major presenting symptoms were irritation, foreign body sensation, lacrimation, and redness. In each case, the symptoms began while the affected individual was working in a farm or travelling outdoors, during the days. None of the patients had history of allergic reactions in the past. In all cases, the eye involvement was unilateral and extraocular with motile larvae present in the bulbar conjunctiva. All patients were having injection of conjunctiva, lid edema but one patient also had chemosis. There was no evidence of corneal or intraocular involvement. Visual acuity was also normal in all patients.

After instillation of Proparacaine eye drop to paralyze the larvae and after photographic documentation, we removed the maggots with cotton tip applicator and the eyes washed out with normal saline. The number of larvae varied from three to six and measured 1 – 2 mm in length. They were mounted on a microscope slide, examined carefully, and photographed under a microscope and compared with Oestrus Ovis larvae in literature. The larvae were identified as first instars of Oestrus ovis (Diptera: Oestridae) which is a larviparous dipteran on the basis of their spindle shape, translucent, segmented body and two large dark oral hooks connected to a white cephalopharyngeal skeleton.

An antibiotic and steroid eye drops were started. Following removal of all larvae, the symptoms completely resolved within a few hours or days.

Discussion
Myiasis is the infestation of tissues and organs of animals or man by dipterous larvae. The most common site of infestation is the skin wound. Less common sites are eyes, nose, paranasal sinuses, throat, and urogenital tract.
Ophthalmic myiasis is due to deposition of fly larvae in the human eye. Various species of flies are able to provoke opthalmomyiasis, including Oestrus ovis (sheep nasal botfly), latrine fly (Fannia), house fly (Musca domestica), and cattle botfly (Hypoderma). Oestrus ovis is by far the most common (80-90%) cause of ophthalmic myiasis in human [3]. Ophthalmic myiasis due to Oestrus ovis was described for the first time in 1947 by James [4]. More scattered cases have been reported since then from Mediterranean area, like Italy, and also from Russia, Serbia (previous Yugoslavia), India, [9-10] Africa [6-7], America, Oman and Iran [1-5].

Ophthalmomyiasis is more common than what have been indicated by previously published reports. Ophthalmomyiasis mostly occurs in rural areas, where man lives in close contact with cattle. An interesting feature of O. ovis is that it can deposit larvae while still in flight. The fly darts close to the eyes or nostrils and ejects a stream of the first-instar larvae, which have previously hatched from the eggs in the fly vagina, into the target area. The sheep and goat are the main hosts for myiasis by Oestrus ovis and the men are infested accidentally. This eye involvement by Oestrus ovis is in the form of external opthalmomyiasis, which is confined to conjunctiva, eyelid, and lacrimal ducts, as first instar larvae have no bite organs and are unable to secrete proteolytic enzymes. [6-7]

In humans, O. ovis larvae generally do not develop past the first instar stage, although other species may grow much larger. They are capable of living in eye fluid, freely crawling on the eye balls with the help of anterior hooks and cause irritation by their curved mandibular barbs and body spines.

Grammer et al. summarized numerous cases of external opthalmomyiasis due to Oestrus ovis. [3]

Masoodi et al. described few cases of external opthalmomyiasis caused by oestrus ovis in farmers in close contact with sheep and goat. [1] Misra et al. described external opthalmomyiasis due to Oestrus ovis as endemic disease in rural central India. [9]

Narayanan et al. documented few cases of opthalmomyiasis due to Oestrus ovis in southern part of India in 1981.[10]

Symptoms, such as severe eye irritation, redness, foreign body sensation, pain, lacrimation, and swelling of the lids, season of occurrence, and also predominance of young male patients presented in our case series are similar to those described in other reports. [1-3],[9-10] All of the 4 cases lived in rural areas, farmers and two of them belong to Ahir caste live in close contact with sheep and goats. Complications such as corneal ulcer, invasion into eye globe, and decreased vision are not usual and none of these complications were encountered in our patients. But the larvae from other species such as Hypoderma [1] or Chrysomyia bezziana [8] can penetrate the eye globe and cause endophthalmitis and iridocyclitis, and may even lead to blindness.

Our experience showed that larvae quickly die and dry out once removed from the eye. Removed larvae should be preserved in 70% alcohol and sent to specialists for examination. We could not immediately find specialists to help us preserving the species. We therefore tempted to identify the larvae as Oestrus ovis based on microscopic appearance (translucent body, segmentation, large dark oral hooks connected to a white cephalopharyngeal skeleton) and extended study of the literature [1-3],[7],[9-10].

The treatment consists of anesthetizing the larvae and conjunctival sac and mechanical removal of the larvae. Topical steroids relieve symptoms. Topical antibiotics are useful in preventing secondary bacterial infection. Some people advocate hypertonic saline ointment in order to kill possibly remaining maggots by dehydration. Follow up examination by an ophthalmologist is recommended to avoid the rare possible complication of internal opthalmomyiasis by other species.

External Ophthalmomyiasis should be considered as an occupational disease among farmers and shepherds. As the larvae are small, translucent and quickly avoiding the slit lamp beam, they can be easily overlooked on routine examination. Awareness of the larval conjunctivitis in rural areas, especially during spring and summer, leads to the more prompt diagnosis, and institution of specific therapy for the disease. Identification of the species is important to estimate the risk of penetration of the globe.

Figure 1 Larva of Oestrus ovis on lid margin

Figure 2 Larva of Oestrus ovis.
Table 1 Clinical findings in patients of Ophthalmoamyiasis

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Age</th>
<th>Sex</th>
<th>Caste</th>
<th>Date of Presentation</th>
<th>Place of Occurrences</th>
<th>No. of Larvae recovered</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>30</td>
<td>Male</td>
<td>Vasava</td>
<td>10.01.09</td>
<td>Working in the field</td>
<td>6</td>
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<td>2.</td>
<td>35</td>
<td>Male</td>
<td>Vasava</td>
<td>17.03.09</td>
<td>Traveling on a bike</td>
<td>4</td>
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<tr>
<td>3.</td>
<td>25</td>
<td>Female</td>
<td>Ahir</td>
<td>24.03.09</td>
<td>Working in the field</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>60</td>
<td>Male</td>
<td>Ahir</td>
<td>28.04.09</td>
<td>While Grazing Goats/Sheeps in the field</td>
<td>3</td>
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References