

# External ophthalmomyiasis due to *Oestrus ovis* — a rare case series

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## ABSTRACT

Ophthalmomyiasis is an uncommon clinical entity in ophthalmic practice. We report a case series of three patients with external ophthalmomyiasis who presented to a secondary care centre in Pathankot, Punjab, with a history of sudden onset and severe foreign body sensation in the eye. On evaluation, all patients were found to have multiple larvae in the conjunctival sac. They were managed with careful extraction of larvae followed by topical medication. Microbiological analysis identified them as larvae of *Oestrus ovis* fly in all cases. External ophthalmomyiasis is an uncommon and possibly under-reported entity in North India that requires early diagnosis and treatment.

**KEY WORDS:** ophthalmomyiasis; *Oestrus ovis*; sheep nasal botfly

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## INTRODUCTION

Ophthalmomyiasis refers to an infestation of the orbital and ocular structures by larvae of various species of flies. It is broadly categorized into external, internal, or orbital myiasis based on the part of the eye infested [1]. The condition has been reported from various parts of the world over the last century, with the first case reported by Keyt in 1900 [2]. Many species of flies have been reported to cause ophthalmomyiasis, with *Oestrus ovis* being the most typical cause [3]. Depending on the extent of invasion, environmental conditions, and immune status of the patient, the clinical features of the infestation may range from conjunctivitis to extensive tissue destruction and necrosis. We report a case series of three patients who presented within a span of one week with acute red eye due

to external ophthalmomyiasis caused by the larvae of *Oestrus ovis* fly from a residential area in Pathankot, Punjab.

## CASE PRESENTATION

### Case 1

A 45-year-old male presented with a history of an unidentified foreign body going into the right eye while taking a walk outdoors, which was shortly followed by severe irritation and a “crawling” foreign body sensation in the right eye. On evaluation under diffuse light of the slit lamp, three mobile larvae were seen in the conjunctival sac (Fig. 1). They displayed an aversion to light, agitation on instillation of topical anesthetic (proparacaine 0.4%), and demonstrated proximal adherence to the conjunc-

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**FIGURE 1.** Larva in palpebral conjunctiva. A translucent segmented body with spinous processes and oral hooks are seen

tiva on attempted removal. The larvae were gently removed with fine, non-toothed forceps ensuring that the entire organism was retrieved intact. After that, the patient was started on a topical antibiotic and lubricating agent course.

### Case 2

A 32-year-old male reported a history of foreign body sensation in the right eye of one-day duration. There was no history of a foreign body going in the eye or trauma. He obtained partial relief of symptoms by washing his eyes with plain water. However, an hour later, he experienced severe pricking pain associated with a feeling of something crawling within the eye. On evaluation, he was found to have multiple larvae within the conjunctival sac of the right eye. The larvae demonstrated agitation to light and topical anesthetic, and many migrated into the fornices ([Supplementary File — Video 1](#)). A total of 12 live and dead larvae were retrieved from the conjunctival sac of the patient's right eye over a period of one hour, followed by topical antibiotic and lubricant eye drops.

### Case 3

A 28-year-old male presented with a history of something hitting his left eye while tending to his garden. Immediately following the incident, he developed pain, watering, and foreign body sensation in the left eye, which persisted despite washing the eye with abundant water. He presented the next day and, on evaluation, was found to have two immobile, dead larvae in the inferior palpebral conjunctiva and one dead larva in the inferior fornix. The larvae were gently removed using fine forceps. After that, the patient was started on topical antibiotics and lubricating agents.

## RESULTS

All patients were immunocompetent adult males with no history of trauma or contact with animals. In all three cases, the larvae were removed under a topical anesthetic agent, with due care to retrieve the entire organism intact. Given the aversion of the organism to light and anesthetic, all patients were observed for one to two hours to remove any larvae that migrated back to palpebral conjunctiva from the fornices. All patients had diffuse conjunctival congestion with watery discharge and clear cornea. Hence, they were prescribed topical antibiotic (moxifloxacin 0.5% eye drops) and lubricating agent (carboxymethylcellulose 0.5% eye drops) after removing the larvae, which were mounted on slides and sent for identification of the organism. When examined under the microscope, the larvae were found to possess retractile hook-like structures at the oral aperture, a cephalopharyngeal skeleton with a segmented body, spinous processes from the intersegmental area which enabled vermiform movements and were identified as the larvae of *Oestrus ovis* fly (Fig. 2 and [Supplementary File — Video 2](#)).

All patients were followed up frequently for two weeks and reported no complications. The complete ophthalmic examination carried out subsequently was normal in all cases.

## DISCUSSION

Myiasis is the infestation of human tissue with larvae of various species of flies. It most commonly affects the skin wounds; eyes, nasal mucosa and sinuses, urogenital tract being involved less commonly [4]. Ophthalmomyiasis is an uncommon



**FIGURE 2.** Microscopic appearance of the larva. Cephalopharyngeal skeleton with oral hooks are seen

clinical entity that is seen in less than 5% of all cases of human myiasis worldwide [4]. It is caused by flies of the order *Diptera*, with the most common agents being *Dermatobia hominis* (human botfly), *Oestrous ovis* (sheep nose botfly), *Hypoderma bovis* (ox warble fly), and *Lucilia sericata* (green bottlefly) [5].

*Oestrous ovis*, also known as the sheep nasal botfly, is a common parasite of sheep and goats and has a peculiar life cycle. The eggs hatch in the vaginal cavity of the adult female fly then the fly deposits its first instar larvae in the nostrils of these animals. The first instars migrate to the sinuses, where they develop into second and finally third instar larvae, which are then released to the environment for the pupal stage. The duration of this parasitic stage is variable and may range from a few weeks to many months, mainly depending on the region's climatic conditions [6]. A peculiar feature of the *Oestrus ovis* fly is its ability to larviposit in the nostrils of its primary hosts without making actual contact by darting a jet of larvae into the nasal cavity when the hosts are in proximity of these flies while grazing. Humans become accidental hosts when these larvae are deposited on the ocular surface, and in these instances, the larvae do not develop beyond the first instar stage [7].

This condition is more prevalent in tropical regions with poor hygiene, overcrowding, low socio-economic strata, and in patients with debilitating diseases or infected, open wounds [7]. The larvae enter the eye in an outdoor environment; hence men are more likely to be affected. Demographically speaking, most cases in India have been recorded from the southern states, with sporadic, isolated cases reported from other parts of the country and worldwide [8–19]. To our knowledge, this is the first series of three cases occurring in close succession in an urban residential area of Punjab.

Once the larvae enter the ocular milieu, the host response depends on multiple factors. Most patients seek help immediately due to sudden and severe irritation and foreign body sensation, as in the cases encountered at our centre. Similar findings have also been reported by Majumder et al. [9], Singh et al. [14], Sharma et al. [15], among other authors. A series of 10 cases were reported by Sucilathangam et al. in 2013 from Tamil Nadu, India [13]. All patients were farmers by occupation and had close contact with sheep and goats. In contrast, none of our patients had any close contact with livestock or farms.

There have also been case reports of *Oestrous ovis* larvae causing periorbital myiasis and ophthalmo-

myiasis interna, although these are relatively much rarer. Parikh et al. reported a case of bilateral ophthalmomyiasis interna caused by *Oestrous ovis*, with the larvae involving the posterior segment of the eye [7]. Another case of first instars of *Oestrous ovis* infesting basal cell carcinoma in the periocular region was reported by Sardesai et al. in 2014 from Maharashtra, India [20].

Most cases of external ophthalmomyiasis recover well without any long-term sequelae. In a case report by Kumar et al. in Puducherry, India, in 2013, the patient had persistent symptoms despite removing larvae and topical steroid-antibiotic, which subsided on the administration of oral ivermectin 12 mg single dose [10]. Since external ophthalmomyiasis presents with irritation, discharge, and a foreign body sensation along with conjunctival inflammation, it may easily be mistaken for mucopurulent conjunctivitis; hence a high index of suspicion is warranted. Once the diagnosis is made, it is crucial to carefully remove all larvae in totality, as any remnants of larvae left behind may incite an intense inflammatory reaction. It is also essential to prescribe an adequate dosage of topical antibiotics to prevent secondary infection, as well as topical lubricants to alleviate irritation and soothe the ocular surface.

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