

Case Report

# Ophthalmomyiasis Externa: A Case Report in a Tertiary Care Center in Riyadh, Saudi Arabia

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## Keywords

Ophthalmomyiasis · *Oestrus ovis* · Conjunctivitis · Sheep bot fly

## Abstract

**Introduction:** Ophthalmomyiasis externa, which is caused by *Oestrus ovis* larvae, is a parasitic eye infestation that is prevalent in tropical and subtropical regions. It occurs in rural settings and is associated with risk factors, such as poor sanitation and underlying health conditions. Reports on this disease in Saudi Arabia are rare. **Case Presentation:** A 30-year-old man from a rural area in Riyadh presented with severe left eye irritation and redness after being hit by an insect. Examination revealed seven motile larvae, which were identified as *O. ovis*, on the conjunctiva. The larvae were mechanically removed, and the patient was treated with topical antibiotics. On follow-up, four additional larvae were found and removed. Symptoms resolved completely, with no further larvae detected on subsequent follow-up. **Conclusion:** Thorough history and examination are essential for the diagnosis of ophthalmomyiasis, especially in rural areas. Early detection and intervention are vital to prevent serious complications. This case highlighted the importance of awareness among healthcare providers.

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## Introduction

Myiasis is a parasitic tissue infestation that affects humans and animals, especially livestock [1]. It is caused by the larvae of Diptera flies, which is an order of insects that encompass approximately 150,000 species, such as *O. ovis* (sheep bot fly), which is the most common cause of ophthalmomyiasis externa; *Gasterophilinae* (horse bot fly or horse warble

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fly); *Wohlfahrtia magnifica* (sheep maggot fly); *Chrysomya bezziana* (screwworm fly); *Cordylobia anthropophaga* (tumbu fly); and *Dermatobia hominis* [2]. Although the larva mainly targets the skin, it has been isolated from the nose, eyes, genitourinary tract, and gastrointestinal tract [3]. Ophthalmomyiasis is common in tropical and subtropical regions and has been reported to be frequent in rural areas, where cattle are usually raised [3]. Poor sanitation, alcoholism, diabetes, malignancies, HIV, eye trauma or surgery, and advanced age were found to be the risk factors for ophthalmomyiasis [3, 4].

To the best of our knowledge, there are only few reports on ophthalmomyiasis externa in Saudi Arabia [4–6]. In this study, we reported the history, clinical presentation, and management of a case of ophthalmomyiasis externa in a tertiary hospital in Riyadh, Saudi Arabia. The CARE Checklist for this case report has been completed by the authors and is attached as an online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000541762>).

### Case Report

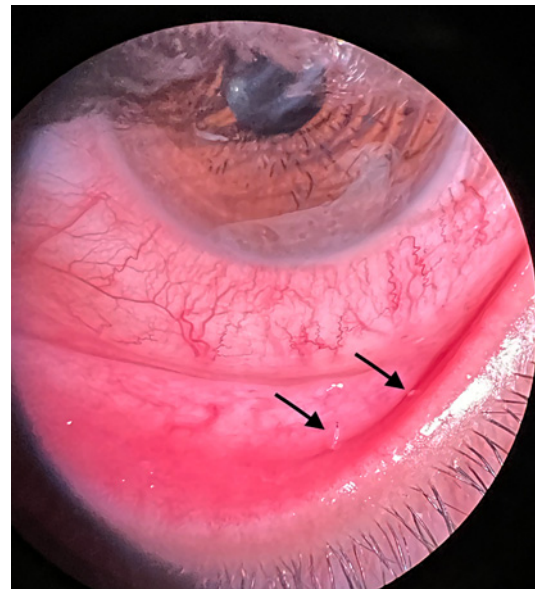
A 30-year-old man presented to the ophthalmology emergency room complaining of a 1-day history of severe irritation, redness, and tearing of the left eye. The patient gave a history of being hit by an insect the day before in a rural area in Riyadh province, where the patient lived. He had no history of contact with livestock or any animal and is not known to have any illnesses.

On examination, the uncorrected visual acuity was 20/20 on both eyes, and there were conjunctival injection and hyperemia on the left eye. Seven motile, white, translucent larvae were found floating over the conjunctiva. Upon eversion, a pupillary reaction on the left upper palpebral conjunctiva was noticed. The cornea was clear without apparent abrasion or infiltrate, and the anterior chamber was deep and quiet without any reaction. A dilated fundus exam showed clear vitreous with a flat retina and without signs of any larvae.

After applying 1% tetracaine hydrochloride (Bausch & Lomb Incorporated, Tampa, FL, USA), the seven larvae were removed using Barraquer Cilia forceps (FCI S.A.S., Paris, France) while avoiding injury to the cornea and conjunctiva. Fluorescein sodium 1% drops (Bausch & Lomb Incorporated, Tampa, FL, USA) were instilled to check for any corneal or conjunctival abrasions, which were not present. The larvae were fixed on slides and sent to the microbiology laboratory of our hospital for identification. The patient was discharged home with medications moxifloxacin 0.5% drops four times a day; carboxymethylcellulose sodium 0.5%; olopatadine hydrochloride 0.1% (Jamjoom Pharmaceuticals Co., Jeddah, Saudi Arabia); and erythromycin 0.5% ointment (Amman Pharmaceutical Industries, Amman, Jordan). On follow-up the next day, the patient reported improvement in symptoms and conjunctival congestion. However, four remaining larvae were found on examination and removed using the same technique. At this time, the laboratory confirmed that the larval specimen was identified as *O. ovis*. On day 10, the patient reported a complete resolution of symptoms, and examination confirmed the absence of larvae (Fig. 1–3).

### Discussion

Ophthalmomyiasis secondary to *O. ovis* was first described by James MT in 1947, although the term myiasis was first used by Hope FW in 1840 [7]. It refers to ocular tissue infestation by larvae of Diptera flies. Behr C classified ophthalmomyiasis as externa, which occurs when



**Fig. 1.** Two larvae are seen on the palpebral conjunctiva upon eversion of the lower lid.



**Fig. 2.** One larva is seen on the bulbar conjunctiva.

the larvae are restricted to the lids, conjunctiva, or lacrimal ducts; interna anterior, when the larvae invade the globe and into the anterior chamber; and interna posterior, when the larvae are in the posterior chamber [5, 8]. Ophthalmomyiasis externa presents with symptoms of eye redness, pain, tearing, and foreign body sensation resembling catarrhal conjunctivitis, pseudomembranous conjunctivitis, or punctate keratitis; in some cases, corneal infiltration might accompany the condition [9, 10].

In human hosts, *O. ovis* larvae do not mature into adult flies but instead stagnate at the first larval stage [7, 11]. Invasion of the globe is not common for *O. ovis* larvae, unlike other species, such as *Hypoderma bovis*. However, ophthalmomyiasis interna posterior secondary to sheep bot fly larvae has been reported in literature; vision loss occurred as early as 24 h after being struck by the fly in one case and as late as 17 days after being bitten by an insect in another case [11, 12]. Our patient lived in a rural area, where there are numerous cattle farms, and presented with unilateral conjunctivitis with no extension beyond the outer tissue and adnexa.



**Fig. 3.** *O. ovis* larvae on microscopy. The larvae have two hooks attached firmly to mucous membranes, such as the conjunctiva.

Topical anesthesia and mechanical removal are the mainstays of treatment because simple normal saline irrigation or using a cotton applicator might not be sufficient, considering the firm attachment of the larvae hooks to the underlying tissue. Among the reported cases, manual extraction and topical antibiotics were used in more than half, whereas topical steroids were used in more than 40% [13]. Topical anesthesia may facilitate larvae paralysis and removal [14]. Topical antibiotics, such as tobramycin and ciprofloxacin, can be used to prevent secondary infection [14, 15]. In an in vitro study, topical ivermectin with povidone 0.6% was reported to be effective for larvae eradication and treatment for ophthalmomyiasis [16]. Furthermore, ophthalmic ointment has been shown to facilitate larval extraction by blocking the respiratory pores and suffocating the larvae [17]. One case report showed improvement after tobacco juice application [18]. Systemic antibiotics have been documented in literature, although they are not usually utilized [13]. Follow-up is crucial because complete larvae removal cannot be determined in one setting and in order to avoid a more detrimental complication of larvae invasion into the inner structures of the globe.

### Conclusions

In patients presenting with conjunctivitis, meticulous history taking and thorough evaluation, including eversion of the lids, examination of the fornices, and a dilated fundus examination, are essential. The symptoms of ophthalmomyiasis may be indistinguishable from other causes of conjunctivitis, especially in rural communities. Early diagnosis and management of ophthalmomyiasis are crucial to prevent further larvae extension and serious complications. Moreover, clinicians should be aware of the risk of posterior segment penetration, even after apparent symptom resolution, and continue monitoring patients beyond the initial treatment period.

### Statement of Ethics

This study was reviewed and approved by the Institutional Review Board of King Abdullah International Medical Research Center, Riyadh, Saudi Arabia, Approval No. IRB/2422/23. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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### Author Contributions

Yasser I. Althnayan, MD: data curation, investigation, methodology, and writing; Omar S. Alhadlaq, MD: conceptualization, validation, and reviewing.

### Data Availability Statement

All data generated or analyzed in this study are included in this article. Further inquiries can be directed to the corresponding author.

### References

- 1 Francesconi F, Lupi O. Myiasis. *Clin Microbiol Rev.* 2012;25(1):79–105. <https://doi.org/10.1128/CMR.00010-11>
- 2 Guerrant R, Walker D, Weller P, Blacksell S. Tropical Infectious diseases: principles, pathogens, and practice. *Clin Infect Dis.* 2007;44(2):314–5. <https://doi.org/10.1086/510435>
- 3 Huang YL, Liu L, Liang H, He J, Chen J, Liang QW, et al. Orbital myiasis: a case report and literature review. *Medicine.* 2020;99(4):e18879–203. <https://doi.org/10.1097/MD.00000000000018879>
- 4 Sharma K. Ophthalmomyiasis externa: a case report from AlKharj, Saudi Arabia. *Saudi J Ophthalmol.* 2018;32(3):250–2. <https://doi.org/10.1016/j.sjopt.2017.11.005>
- 5 Al-Amry M, Al-Saikhan FI, Al-Dahmash S. External ophthalmomyiasis: a case report. *Saudi J Ophthalmol.* 2014;28(4):322–4. <https://doi.org/10.1016/j.sjopt.2013.08.002>
- 6 Scrimgeour EM, El-Azazy OM. Significance of cutaneous and ophthalmic myiasis in Saudi Arabia. *Ann Saudi Med.* 1995;15(3):295–6. <https://doi.org/10.5144/0256-4947.1995.295>
- 7 James MT. The flies that cause myiasis in man. Washington DC: US Dept Agric Misc Publ.; 1947. Vol. 631.
- 8 Behr C. Ophthalmomyiasis interna and externa. *Klin Monatsbl Augenheilkd.* 1920;64:161–80.
- 9 Masoodi M, Hosseini K. External ophthalmomyiasis caused by sheep botfly (*Oestrus OVIS*) larva: a report of 8 cases. *Arch Iran Med.* 2004;7(2):136.
- 10 Sundu C, Dinç E, Kurtuluş UC, Yıldırım Ö. Ophthalmomyiasis externa: a report of three cases. *Turk J Ophthalmol.* 2015;45(5):220–2. <https://doi.org/10.4274/tjo.70456>
- 11 Parikh V, Biswas J, Vaijyanthi K, Das D, Raval V. Bilateral ocular myiasis interna caused by botfly (*Oestrus ovis*): a case report. *Ocul Immunol Inflamm.* 2011;19(6):444–7. <https://doi.org/10.3109/09273948.2011.622455>
- 12 Rakusin W. Ocular myiasis interna caused by the sheep nasal bot fly (*Oestrus ovis* L.). *S Afr Med J.* 1970;44(40):1155–7.

- 13 Martinez-Rojano H, Huerta H, Sámano R, Chico-Barba G, Mier-Cabrera J, Plascencia-Nieto ES. Ophthalmomyiasis externa and importance of risk factors, clinical manifestations, and diagnosis: review of the medical literature. *Diseases*. 2023;11(4):180. <https://doi.org/10.3390/diseases11040180>
- 14 Thakur K, Singh G, Chauhan S, Sood A. Vidi, vini, vinci: external ophthalmomyiasis infection that occurred, and was diagnosed and treated in a single day: a rare case report. *Oman J Ophthalmol*. 2009;2(3):130–2. <https://doi.org/10.4103/0974-620X.57313>
- 15 Velez V, Mikov O. Ophthalmomyiasis caused by larvae of the parasite *Oestrus ovis*. *QJM Int J Med*. 2018; 111(10):727–8. <https://doi.org/10.1093/qjmed/hcy106>
- 16 Denion E, Dalens PH, Couppié P, Aznar C, Sainte-Marie D, Carme B, et al. External ophthalmomyiasis caused by *Dermatobia hominis*. A retrospective study of nine cases and a review of the literature. *Acta Ophthalmol Scand*. 2004;82(5):576–84. <https://doi.org/10.1111/j.1600-0420.2004.00315.x>
- 17 Mannis M, Holland E. *Cornea: fundamentals, diagnosis and management*. 4th ed Vol. 1. New York: Elsevier; 2017; p. 347.
- 18 García-Guerrero J, Garza-Quiñones J, Reza-Caballero J, González-Treviño JL. External ophthalmomyiasis by *Oestrus ovis* treated with tobacco: clinical case report and medical literature review. *Med Univ*. 2014;16(65): 181–3.