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Ophthalmomyiasis Externa: Case Report of the Clinicopathologic Features

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Abstract

Ophthalmomyiasis externa is the infestation of the superficial external ocular structures by fly larvae. This is a particularly rare condition, which has nevertheless been reported in several countries worldwide. Presented herein are the clinicopathologic features of ophthalmomyiasis externa which occurred in an adult patient. The patient responded well to treatment following thorough ophthalmological examination and prompt diagnosis.

Keywords

Ophthalmomyiasis; *Oestrus ovis*; Myiasis

Introduction

Ophthalmomyiasis is the infestation of ocular or orbital tissues by fly larvae. Ophthalmomyiasis externa refers to the involvement of superficial external ocular structures and represents the commonest presentation of ocular myiasis [1–3]. *Oestrus ovis* (sheep bot fly) is the most common cause of ophthalmomyiasis in humans and usually affects shepherds and farmers. However, cases may also occur in suburban and urban regions [1,4–8]. The initial signs and symptoms of ophthalmomyiasis may mimic commonly occurring ocular infections and inflammatory reactions such as conjunctivitis. Therefore, thorough ophthalmological examination and confirmation of this disease process are required to avoid misdiagnosis and delay in definitive treatment.

Ophthalmomyiasis is a rare condition and case reports of human ophthalmomyiasis in South Africa have been attributed to *Oestrus ovis* [8–11]. Herein we present clinicopathologic features of ophthalmomyiasis externa in an urban-dwelling adult patient.

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Declaration

The authors declare the absence of conflict of interest.

Consent

The patient has provided written consent for publication of this article.

Case History

A 30 year old male patient, an urban construction worker, presented with sudden onset of painful and reddened left eye. There was no history of trauma, significant travel history or recent exposure to farm animals.

Ophthalmic inspection revealed left-sided conjunctival hyperaemia and mild chemosis with obvious patient discomfort. Slit lamp examination revealed tiny sheep bot fly larvae (Figures 1a and 1b). The external parasites were immediately removed under local anaesthetic at the slit lamp. The subconjunctival parasites were subsequently removed under the operating microscope. No parasites had penetrated the sclera or advanced into the orbit. The patient was treated with oral mebendazole for three days.

Pathology

Five parasitic larvae, ranging in size from 1 to 4mm were submitted from the conjunctiva of the left eye.

Microscopic examination revealed non necrotising granulomatous inflammation which surrounded the parasitic structures. Dense infiltration by eosinophils was evident and there were distinct areas of Splendore-Hoeppli phenomenon. The structures contained external cuticles with prominent radially orientated external spines. The cephalopharyngeal skeleton, prominent hooks, organoid internal structures and striated muscle were morphologically discernible (Figures 2 and 3). The striated muscle was subsequently highlighted by Masson Trichrome stain.

The clinical and pathological features confirmed the diagnosis of ophthalmomyiasis externa.

Discussion

Myiasis is the infestation of tissues and/or organs of animals or man by fly larvae (maggots). These are also known as dipterous larvae and skin wounds are usually the most common site of infestation [1,2]. Ophthalmomyiasis is the infestation of ocular or orbital tissues by fly larvae and [3] various species of flies are able to induce ophthalmomyiasis. These are inclusive of *Oestrus ovis* (sheep bot fly), latrine fly (*Fannia*), house fly (*Musca domestica*), cattle botfly (*Hypoderma*) and *Dermatobia hominis* [1,5]. The most common cause of ophthalmomyiasis in humans is *Oestrus ovis* which usually affects shepherds and farmers. However, cases may also occur in suburban and urban regions [4,6,7]. Our patient is an urban-dweller who had no recent exposure to farm animals. Ophthalmomyiasis due to *Oestrus ovis* has been reported in India, Iran, Afghanistan, France, Russia and America [1,6,7,12,13]. This case study contributes a report of human ophthalmomyiasis in South Africa [8–11].

Predisposing conditions to ophthalmomyiasis include local factors such as eye infections or ocular wounds which may have been surgically induced or traumatic in nature, advanced age, debilitation and poor general health [1,3,14,6]. Our patient is a healthy young male who had no predisposing surgical wounds or eye infections.

Some diptera species are larviparous and inject their larva into the eyes, nostrils and nasopharynx of sheep, goats and humans [3]. In humans, the larvae develop in the conjunctival sac, producing ophthalmomyiasis [15].

Oestrus ovis larvae are unable to secrete proteolytic enzymes; therefore they are mostly confined to the outer surfaces of the eye [16].

Ophthalmomyiasis externa represents the commonest presentation of ocular myiasis and involves the superficial external ocular structures. In contrast, ophthalmomyiasis interna is the invasion of the ocular globe by oestrid flies which penetrate the conjunctiva and sclera, thus invading the subretinal space and vitreous cavity [6]. *Dermatobia hominis*, unlike *Oestrus ovis*, is capable of invading the ocular coats, causing significant morbidity due to ophthalmomyiasis interna [2,5].

Afflicted patients may present with catarrhal or follicular conjunctivitis, keratitis, corneal abrasions, periorbital oedema, lacrimation, ocular pruritis, and foreign body sensation or reduced visual acuity. Due to the rarity of ophthalmomyiasis and overlapping symptoms with more commonly occurring ophthalmic conditions, thorough ophthalmic examination is required to avoid misdiagnosis and delay in treatment [14,17,18].

Definitive diagnosis and classification are usually made once the larvae are found and submitted for identification to entomologists. Precise identification of the species may necessitate examination of the adult fly [15]. The first instar larval stage of *Oestrus ovis* contains prominent anteriorly located hooks which are attached to the cephalopharyngeal skeleton [8].

Treatment of external ophthalmomyiasis includes systemic Ivermectin and surgical extraction of the larvae under local anaesthesia. Steroids and antibiotic prophylaxis may also be indicated [2]. Our patient responded well to oral mebendazole as Ivermectin was not available at our hospital. The subconjunctival parasites that could not be removed, or were not seen at first presentation, were rendered immobile after one day of treatment with mebendazole. The patient has subsequently experienced complete and uneventful recovery.

The differential diagnosis includes *Tunga penetrans* (chigoe flea) which burrows into skin and may be mistaken for fly larvae. However, these are usually contained within epidermis and tend to invade human skin as an adult with its head region extending through the epidermis. Identification of striated muscle in the structure excludes the presence of helminths/nematodes. Arthropods contain striated muscle as well as branching trachea-like ribbed tubes [18].

In conclusion, presented herein are clinicopathological features of ophthalmomyiasis externa in an adult male patient who responded well to treatment following prompt recognition and treatment of this rare condition.

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References

1. Masoodi M, Hosseini K. External ophthalmomyiasis caused by sheep botfly (*Oestrus ovis*) larva: A report of 8 cases. Arch Iranian Med. 2004; 7:136–139.
2. Denion E, Dalens PH, Couppié P, Aznar C, Sainte-Marie D, et al. Case Series External ophthalmomyiasis caused by *Dermatobia hominis*. A retrospective study of nine cases and a review of the literature. Acta Ophthalmol Scand. 2004; 82:576–584. [PubMed: 15453857]
3. Khataminia G, Aghajanzadeh R, Vazirianzadeh B, Rahdar M. Orbital myiasis. J Ophthalmic Vis Res. 2011; 6:199–203. [PubMed: 22454736]

4. Grammer J, Erb C, Kamin G, Wild M, Riedinger C, et al. Ophthalmomyiasis externa due to the sheep botfly *Oestrus ovis* in South-West Germany. *Ger J Ophthalmol.* 1995; 4:188–195. [PubMed: 7663333]
5. Lagacé-Wiens PR, Dookeran R, Skinner S, Leicht R, Colwell DD, et al. Human Ophthalmomyiasis Interna Caused by *Hypoderma tarandi*, Northern Canada, Northern Canada. *Emerg Infect Dis.* 2008; 14:64–66. [PubMed: 18258079]
6. Dunbar J, Cooper B, Hodgetts T, Yskandar H, van Thiel P, et al. An outbreak of human external ophthalmomyiasis due to *Oestrus ovis* in Southern Afghanistan. *Clin Infect Dis.* 2008; 46:e124–e126. [PubMed: 18426373]
7. Suzzoni-Blatger J, Villeneuve L, Morassin B, Chevallier J. A case of external human ophthalmomyiasis by *Oestrus ovis* in Toulouse (France). *J Fr Ophtalmol.* 2000; 23:1020–1022. [PubMed: 11139696]
8. Zumpt F. Ophthalmomyiasis in man with special reference to the situation in Southern Africa. *S Afr Med J.* 1963; 37:425–428. [PubMed: 14004090]
9. Herbolzheimer W. Description of conjunctival ophthalmomyiasis with reference to a case history (subconjunctival oestridae larvae). *Klin Monbl Augenheilkd.* 1981; 179:370–372. [PubMed: 7339162]
10. Du Toit R, Meyer H. A case in South Africa of ocular myiasis in man due to the first-stage larvae of the nasal bot fly of the sheep (*Oestrus ovis* L). *SAMJ.* 1960; 34:581–582. [PubMed: 13818269]
11. Schrire L. Conjunctival myiasis due to *Oestrus ovis* L. *SAMJ.* 1968; 42:765.
12. Victor R, Bhargva K. Ophthalmomyiasis in Oman: a case report and comments. *Wilderness Environ Med.* 1998; 9:32–35. [PubMed: 11990179]
13. Maretic Z, Nadenic LA, Ladavic J, Zekic R. Ophthalmomyiasis due to *Oestrus ovis*. *Acta Trop.* 1973; 33:369–372. [PubMed: 4149684]
14. Kim JS, Kim JW, Lee HJ, Lee IY, Oh SA, Seo M. Ophthalmomyiasis caused by a *Phormia* sp. (Diptera: Calliphoridae) larva in an enucleated patient. *Korean J Parasitol.* 2011; 49:173–175. [PubMed: 21738274]
15. Markell, EK.; Voge, M.; John, DT. Medical parasitology. 6thedn. Vol. Chapter 10. Philadelphia: WB Saunders Company; 1986. Arthropods and human disease.
16. Odat TA, Gandhi JS, Ziahosseini K. A case of ophthalmomyiasis externa from Jordan in the Middle East. *Br J Ophthalmol.* 2007; 91 Video report.
17. Sreejith RS, Reddy AK, Ganeshpuri SS, Garg P. *Oestrus ovis* ophthalmomyiasis with keratitis. *Indian J Med Microbiol.* 2010; 28:399–402. [PubMed: 20966582]
18. Cockerell, CJ. Myiasis. In: Connor, DH.; Chandler, FW.; Schwartz, DA.; Manz, HJ.; Lack, EE., editors. Pathology of infectious diseases. Vol. Vol 2. Stanford: Appleton & Lange; 1997. p. 1655-1658.

Figure 1.
Conjunctival hyperaemia and mild chemosis with discernible parasitic structures.

Figure 2.
The conjunctiva was infiltrated by numerous eosinophils and granulomatous reaction surrounded a prominent hook structure (H&E; $\times 100$ magnification).

Figure 3.
Well defined cephalopharyngeal structures and radially orientated spines were demonstrated (H&E; $\times 100$ and $\times 400$ magnification).