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Ophtalmomyiasis Externa–Severe Eye Trauma A Case Report

Jela Valaskova[1]*, Ivajlo Popov[1], Juraj Sekac[1], Sandeep Saxena[2], Haaris A. Shiwani[3] Peter Kruzliak[4,5]*, Vladimir Krasnik[1]

[1]Department of Ophthalmology, Faculty of Medecine, Comenius University and University Hospital, Bratislava, Slovakia.

[2]Department of Ophthalmology, King George's Medical University, Shah Mina Road, Lucknow, Uttar Pradesh, India.

[3]Royal Lancaster Infirmary, University Hospitals of Morecambe Bay NHS Trust, Lancaster, United Kingdom.

[4]Department of Internal Medicine, Brothers of Mercy Hospital, Brno, Czech Republic .

[5]2nd Department of Surgery, Faculty of Medicine, Masaryk University and St. Anne´s University Hospital, Brno, Czech Republic.

***Corresponding Authors:** Dr. Peter Kruzliak, Department of Internal Medicine, Brothers of Mercy Hospital, Polni 3, 63900 Brno, Czech Republic.*

Dr. Jela Valaskova, Department of Ophthalmology, Faculty of Medecine, Comenius University and University Hospital, Ružinovská 6,826 06 Bratislava, Slovakia.

Abstract

Myiasis is defined as the infestation of live vertebrates (humans and/or animals) with dipterous larvae. This article reports a case of ophthalmomyiasis externa caused by flesh-fly larvae (Sarcophagidae) in a middle-aged Caucasian male of no fixed abode with alcohol dependance, living in the central Europe.The patient presented with acute symptoms in both eyes, complicated with spreading infection to the nasopharynx and numerous skin wounds. Despite the early diagnosis, mechanical removal of the numerous larvae from conjunctival fornices of both eyes under topical anaesthesia, and local and general treatment, the damage to both eyes was extensive. The left eye globe was removed by enucleation and the healing process of the right eye was accompanied by pseudomembrane formation over the cornea and deep neovascularization inside the cornea. The diagnosis is based on direct evidence using a slit lamp and can be confirmed and specified by parasitological investigations. Standard therapy consists of manual removal of the larvae with wound disinfection, followed by debridement in cases where necrotic tissue still remains. Successs, however, is very time dependant, and patients may present with irreversible sight loss.

Keywords: *Ophtalmomyiasis externa; flesh-fly larvae; cornea.*

Introduction

Myiasis, a noun derived from the Greek term *mya, or fly*, was first proposed by Hope to define diseases of humans caused by dipterous larvae, as opposed to those caused by insect larvae in general [1].

Myiasis has since been defined as the infestation of live vertebrates (humans and/or animals) with dipterous larvae [2]. In mammals (including humans), dipterous larvae can feed on the host's living or dead tissue, bodily fluids, or ingested food and can cause a broad range of infestations, depending on the body location and the relationship of the larvae with the host [3]. The distribution of human myiasis is worldwide, with more species and greater abundance in poor socioeconomic regions of tropical and subtropical countries. In countries where it is not endemic, myiasis is an important condition, where it can represent the fourth most common travel-associated skin disease [4]. Diptera itself is a large order of

insects that are commonly known as true flies. The presence of a single pair of functional wings with a reduced hind wing, termed halteres, distinguishes true flies from other insects [5]. Flies are ubiquitous and abundant, with approximately 150,000 species in 10,000 genera and 150 families. This order contains most of the insects vectoring diseases in humans. A lack of hygiene and poor socioeconomic status, in the presence of an open wound, are the most important predisposing factors for human wound myiasis. Local destruction, invasion into deep tissues, and secondary infection are possible complications of myiasis, especially where obligatory parasites are concerned. In some cases, a facultative agent may prevent or even help treat an infection by cleaning the necrotic tissue, producing substances with bactericidal properties, and stimulating granulation [6].

Ophtalmomyiasis was mentioned and classified anatomically for the first time by Bishop [7]. Ophthalmomyiasis, or oculomyiasis, is the infestation of any anatomic structure of the eye. This group is further subclassified into ophthalmomyiasis externa (or superficial) and ophthalmomyiasis interna. Orbital myiasis, or "ophtalmomyiase profonde" (a French term meaning profound or deep), is used to describe palpebral or periocular infestation with intraocular myiasis. Ophthalmomyiasis externa refers to the superficial infestation of ocular tissue. Conjunctival myiasis is the most common form of ophthalmomyiasis, and it is a relatively mild, self-limiting, and benign disease. Patients commonly complain of acute foreign-body sensation with lacrimation, characteristically with an abrupt onset [8]. Upon examination, unilateral disease is a defining feature. The movement of the larva may be felt by the patient. In response to the movement of the larva across the external surface of the globe, any of the following symptoms may be found on ophthalmologic examination: red eye, photophobia, conjunctival hyperemia, lid edema, punctate conjunctival hemorrhages, pseudomembrane formation, and superficial punctate keratopathy [9-12]. Lacrimal gland myiasis may complicate conjunctival infestation, and a canalicular lesion may also follow external ocular myiasis [13]. Migration through the lacrimal canal to the nasal cavity is a possibility [14].

Ophtalmomyiasis should be considered in any case of unilateral foreign body sensation with a marked onset. Other differential diagnoses of this clinical picture include catarrhal conjunctivitis, keratitis [15], periorbital or preseptal cellulitis [16, 17], keratouveitis [18] and chalazion [19].

Case Report

A 46-year-old man was brought by ambulance to the Ophthalmology Emergency Department in September 2016. Members of the public had found the patient intoxicated, lying near a supermarket. The patient's face was covered with larvae, especially the eyes, and he was referred immediately to the Department of Ophthalmology. On initial assessment, he reported his face had been swollen and he was unable to see for a lengthy period of time. The patient had medical records present in the Hospital Information System that highlighted a lack of fixed abode and alcohol dependence. Visual acuity of the right eye was limited to hand movements and the left eye to no light perception. On both sides of the face, the skin surface of the eyelids and eyelid aperture were covered with many larvae; gross visualisation of the patient's globes was not possible. The first procedure of treatment was manual removal of the larvae from the surface of the eyes and from the fornices. The eyelids were oedematous and red coloured, the margins of the eyelids were rough, the fornices were full of larvae and the conjunctiva were hyperaemic, with superficial and deep inflammatory processes present and patent communications with the nasal cavity. On the right side, there was a semi-transparent cornea without epithelium. The anterior chamber was visible (Fig.1).

Figure 1. *Righteye, firstvisit*

On the left eye, the anterior segment was completely obliterated, and the remainder was necrotic tissue with a very strong foul odour present (Fig.2).

Figure 2. *Lefteye, firstvisit*

We were unable to successfully remove the larvae as there were repeated appearances of new larvae following manual removal. With a subsequent high index of suspicion, the nose and throat were examined, to reveal further larvae in these locations as well. We rinsed the eyelid aperture with a solution of iodine and applied local therapy. B scan ultrasonography showed normal configuration of the right eye globe. The patient underwent ORL examination where communication with the nasopharynx was confirmed. NMR excluded intracranial infection and infection of soft tissues of the orbit, but it showed an inflammatory process inside the right and left maxillary cavity. Dermatological examination revealed skin lesions all over the body. We referred the patient to the Department of Infectology. The samples of larvae were sent for parasitological analysis. The patient spent two weeks at the Department of Infectology where he was treated with tazocin and clindamycin. After his return to the Department of Ophthalmology, we decided to perform enucleation of the left eye. Over the next few months we followed up the right eye, where the process of pseudomembrane formation and neovascularization in the cornea, resulting from the scarred conjunctiva, was observed. Twelve months after the first visit, there was hand movement vision. The motility of the right eye was limited, and the cornea was full of new vessels (Fig.3).

Ultrasound of the other structures, anterior segment and vitreous body with retina showed those structures to be preserved We performed remodelling of the conjunctiva in the upper and lower fornix with an amniotic membrane with partial tarsorrhaphy. The healing process was turbulent due to repeated alcohol intoxication episodes, resulting in tearing of the sutures and eyelid inflammation. Finally, eye movements were recovered, however, not vision. Parasitological examination revealed larvae flesh-fly (*Sarcophagidae*) as the causative agent. Now, the follow-up has been lasting for two years, the patient has regular check-ups every 3 months, and we are still considering the cornea in this particular case (Fig.4).

Figure 3. *Righteye, oneyear followup*

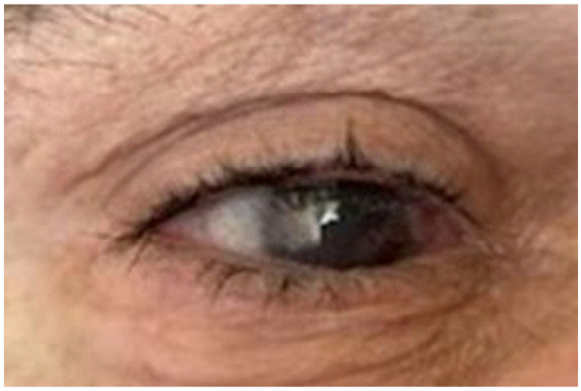

Figure 4. *Righteye, twoyears follow up*

Discussion

Ophthalmomyiasis externa is not typical for this area of Europe, however, poor socio-economic status and open wounds represent strong risk factors for devlopment of this condition [20]. The literature describes similar cases resulting in spontaneous recovery, sometimes even without local pharmacotherapy [21]. Our patient presented with extensive damage of both eyes, which is quite rare. Also, the healing process of the conjunctiva and cornea by the formation of pseudomembranes and deep vascularization is a relatively novel finding. Complications such as keratitis [22] are presented in the literature quite rarely. Stabilization of the patient's condition took approximately 18 months. Visual acuity on the single seeing eye was hand movements. A local finding on the cornea showed deep vascularization. The patient is still followed up and is keen to pursue further therapeutical options. Due to his general health, however, his options are limited.

Conclusion

This is a case report of a patient with ophthalmomyiasis externa, with spread to the nasopharynx and numerous skin lesions over the body. It is a very rare case in developed countries. If such a case were to present, then it is more typical of patients of low socio-economic status in combination with alcohol or drug dependance, or with the presence of a relevant travel history. The diagnosis is based on direct evidence using a slit lamp and can be confirmed and specified by parasitological investigations. Standard therapy consists of manual removal of the larvae with wound disinfection, followed by debridement in cases where necrotic tissue still remains. Successs, however, is very time dependant, and patients may present with irreversible sight loss.

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