

Ocular Myiasis by *Oestrus Ovis* in Portugal: A Case Report

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ABSTRACT

Human myiasis usually occurs in a rural context where people live in direct contact with animals but may also occur in an urban context. The larvae may invade or infest different human tissues, being classified as ophthalmomyiasis or ocular myiasis when they invade the eye or the ocular region and causing important damage. The authors report a 26-year-old male, on holidays in southern Portugal (Algarve), during a walk in a rural area "felt something hitting the eye", followed by a foreign-body sensation and difficulty in opening the eye. At the emergency department twelve larvae were observed, associated with a slight inflammation of the conjunctiva. One larva was morphologically identified as *Oestrus ovis* larva (*Oestridae* family) and assessed as ophthalmomyiasis externa. Molecular identification was attempted by cytochrome oxidase subunit I (COI) PCR amplification of mitochondrial DNA using primers LCO1490 and HCO 2198 but since the amount of source material was small, molecular identification and COI amplification and sequence was unsuccessful. The early diagnosis allowed rapid therapy, with removal of larvae in order to avoid residual lesions, with less complications and destruction of the structures. To our knowledge, this is the first described case of ocular myiasis in Portugal, caused by this species. The case alerts to the diagnosis of these infestations in southern European countries, especially in rural areas, as well as the importance of early diagnosis.

Keywords: Ophthalmomyiasis Externa; Ocular Myiasis in Portugal; *Oestrus Ovis*

Introduction

Myiasis are parasitosis of vertebrate tissues by larvae of dipterous ectoparasites (order Diptera). Several species of flies may cause traumatic or wound myiasis, including flies of the families *Calliphoridae*, *Muscidae*, *Ostridae*, *Phoridae* and *Sarcophagidae*. The occurrence and prevalence of myiasis depend on environmental factors related to the abundance and distribution of the fly population and on the susceptibility of vertebrate hosts. Human myiasis usually occurs in a rural context where people live in direct contact with animals, but also occur in urban area. The larvae may infest different human tissues. When they invade the eye, or the ocular regions are classified

as ophthalmomyiasis or ocular myiasis. Ocular involvement occurs in less than 5% of all cases of myiasis. Ophthalmomyiasis may exist as external (corresponds to 99.62% of the cases described in the Mediterranean countries) or internal forms (about 0.38%) and is typically seen in farmers and shepherds or travelers in rural areas. *Oestrus ovis* is the most common cause of external ophthalmomyiasis. Despite several cases of external ocular myiasis [1,2], there are usually a few cases reported. This condition is very uncommon in Portugal [3,4] and the clinicians are not aware of the diagnosis. In the present case, the identification of the larva was only possible based on the clinical-epidemiological data and on the morphology of the cephalopharyngeal skeleton of the L1 larva.

Case

A 26-year-old male, living in the USA on holidays in southern Portugal (Algarve), during a walk in a rural area refere a subit impact in the right eye "felt something hitting the eye", followed by a foreign-body sensation and difficulty in eye opening . The patient enters the emergency department of the Lagos Hospital in the own day, with complaints of pain in the eye. In the physical exam were observed several live larvae (twelve) on the cornea, associated with a slight inflammation of the conjunctiva. The larvae were removed with zaragatoa cotton bar and placed in a sterile dry tube and sent for analysis at the reference laboratory. It was also made ocular washing, administration of topical antibiotic and covering for 24 hours. In the next day the patient was observed by an ophthalmologist that confirmed the removal of all larvae. There was no evidence of tissue damage, and the patient was discharged with topical antibiotics and corticoid. The patient returns to the USA and reports no consequences.

A larval trace was identified to species under a stero-microscope using keys to third stage larvae of flies causing myiasis [1]. The posterior spiracular plates were not present in the larval trace, so the identification was based on the cephalon pharyngeal skeleton. Both structures are commonly used in morphological identification. Molecular identification was attempted by cytochrome oxidase subunit I (COI) PCR amplification of mitochondrial DNA using primers LC01490 and

HCO 2198 [2]. The larva sample received in the laboratory was homogenized adding 200 µl of Lysis Buffer using a Mixer Mill MM400 (Retsch GmbH, Haan, Germany) with a 3-mm steel bead. The nucleic acids were extracted from the obtained homogenate (NUCLISENS® easy MAG, Biomérieux). Total nucleic acid extraction was performed using the prepared lysate suspensions in the automated platform NUCLISENS® easyMAG (Biomérieux) and eluted into 60 µl. For PCR amplification, 10 µl of DNA and 10 pmol of each primer were added to FastStart PCR master using a final reaction volume of 25µl (Roche, Basel, Switzerland). Polymerase Chain Reaction (PCR) conditions were as follows: denaturation at 95°C for 3 min, 40 cycles of 94°C for 20 s, 50°C for 20 s, and 72°C for 30 s, and a final extension at 72°C for 5 min. Since the amplification resulted in a faint band (observed by electrophoresis in 1.5% agarose -1x TAE gel), a second-round amplification using the same PCR protocol was performed. The obtained amplicons were purified using J ETquick PCR Product Purification Spin kit (GENOMED GmbH, Löhne, Germany) and sequenced using ABI Prism 3130 Genetic Analyzer (Applied Biosystems, Foster City, CA, USA).

Molecular identification was not possible, due to the low DNA concentration obtained by extraction of one larva sample received. The sequence results retrieved had enough quality to obtain the COI sequence. The larva was morphologically identified as *Oestrus ovis* larva (*Ostridae* family) and assessed as ophthalmo myiasis (Figure 1).



Figure 1:

Case Discussion

Human myiasis has a worldwide distribution, with more species and greater abundance in poor socioeconomic regions of tropical and subtropical countries. The main risk factors are poor hygiene conditions and the presence of suppurative lesions (important factor for egg deposition). Most cases are diagnosis accidentally and the true impact of myiasis is not known due to underreporting and absence of agent identification. Myiasis can be classified in: Sanguinivorous or bloodsucking myiasis, cutaneous myiasis (wound, furuncular and migratory forms), cavitary myiasis (ex. ocular, oral, naso-pharyngeal), urogenital and intestinal myiasis. Pseudo myiasis is related with ingestion of accidental larvae [3]. The most frequent myiasis is cavitary where the infestation receives the name of the affected organ, in which are included the ophthalmomyiasis. Ophthalmomyiasis is typically seen in farmers and shepherds or travelers in rural areas. This condition is more frequent in the spring and summer and more often caused by *Oestrus ovis*, but other have been described, like *Gasterophilus* sp., *Wohlfahrtia magnifica*, *Chrysomya bezziana*, *Cordylobia anthropophaga* and *Dermatobia hominis* among others.

Oestrus ovis is a widespread species of fly, known for its parasitic predation which can cause severe impact in veterinary health with significant losses in animal production. It affects mainly sheeps, deers and goats, but it can occasionally be found in cattle, horses, dogs and humans [5,6]. *Oestrus ovis* life cycle initiates as eggs within the female which are fertilized and hatch to larvae of 1 mm within the body of the female. The female then deposits a few larvae, while on the wing, within a tiny mucous drop, directly into a nostril of the host animal. The first stage larvae cross the nasal passage in the mucosa and enter a nasal sinus while molting into a second larval stage. The second larvae stage continues to develop up to 20mm (4/5 inch) in length. When the larva is fully developed it moves down the nasal passage and drops to the ground, where it buries itself and pupates. Life cycle depends on the ambient temperature. This may be 25-35 days in warm weather but up to 10 months in colder climates. The pupa takes from 3-9 weeks to mature, after which the adult hatch [6].

Ophthalmomyiasis can be classified as external (or superficial), when the infestation is in the superficial tissues of the eye, and as internal when there is an intraocular invasion. In external ophthalmomyiasis, conjunctival myiasis is the more frequent form. *Oestrus ovis* is the main agent in the external ophthalmomyiasis, and most cases are seen in cooler areas of northern and southern rural areas. The symptoms are acute and related to the movement and inflammatory response induced by the larva. The number of larvae observed is variable (5-18 larvae). Internal Ophthalmomyiasis may be a complication of external ophthalmomyiasis, with fewer larva's involved (usually one) and the symptoms are more severe: red eye, pain eye, vision loss and scotomas. The species of fly most associated with internal ophthalmomyiasis is *Hypoderma* sp. In this case, the diagnosis of ocular external myiasis was considered based in the epidemiologic context,

acute onset of the clinical picture associated, characteristic symptoms of a foreign-body sensation and pain in the eye. Macroscopic visualization of several larvae (12) in the affected eye and later morphological identification of the species *Oestrus ovis* in laboratory of national reference confirms the diagnosis. Molecular identification was attempted after morphological identification, but the amount of source material was too small and in poor conditions for DNA extraction, PCR amplification and COI sequencing as unsuccessful.)

Complications like corneal ulcers, retinal detachment, orbital cellulitis, and decreased vision are unusual and were absent in our patient. The treatment consists of anaesthetizing the eye followed by mechanical removal of the larvae. Antihistamine drops and/or topical antibiotics may also be used, as needed. In Portugal, most cases of diagnosed myiasis are imported. Although some cases had been described across Europa [7-10]. This is the first case described of ocular myiasis with species identification in Portugal, despite two cases of myiasis were previously reported [3,4]. This case alerts to the existence of these infestations in southern European countries, especially in rural areas, as well as the importance of early diagnosis, with the rapid removal of larvae, to avoid residual lesions.

Learning points

- This case is a good remainder for this unusual diagnostic in southern European countries.
- The early removal of the larva is crucial to reduce inflammatory process and avoid ophthalmic lesions.
- Diagnosis of Cavity Cases is a challenge especially for those doctors who are unfamiliar with the myiasis and its setting.

References

- Service M (2008) Medical Entomology for Students. (5th Edn.), Cambridge Univ Press pp. 289.
- Folmer O, Black M, Hoeh W, Lutz R, Vrijenhoek R (1994) DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. Mol Mar Biol Biotechnol 3: 294-299.
- Bizarro JMS, Nina JS, Ribeiro H, Faustino MRM (1995) Míases: Revisão a propósito de um caso clínico por *Oestrus ovis* Linnaeus. Revista Portuguesa de Doenças Infecciosas. Lisboa 18(1): 75-82.
- André Marques, António Rodrigues, Silvana Belo, Marta Esteves Guedes (2014) CASE REPORT Unusual panuveitis in a child: Toxocariasis associated with ocular myiasis. BMJ Case Rep 2014: bcr2014204475.
- McGarry J, Penrose F, Collins C (2012) *Oestrus ovis* infestation of a dog in the UK. J Small Anim Pract 53(3): 192-193.
- Einer H, Ellegård E (2011) Nasal myiasis by *Oestrus ovis* second stage larva in an immunocompetent man: Case report and literature review. J Laryngol Otol 125(7): 745-746.
- James A Cameron, Nader M Shoukrey, Abdullah A Al-Garni (1991) Conjunctival Ophthalmomyiasis Caused by the Sheep Nasal Botfly (*Oestrus ovis*). American journal of Ophthalmology 112: 331 -334.
- J Suzzoni Blatger, L Villeneuve, B Morassin, J Chevallier (2000) Un cas d'ophthalmomyiase externe humaine à *Oestrus ovis* L. à Toulouse (France). 23(10): 975-1069.

9. Otranto D, Cantacessi C, Santantonio M, Rizzo G (2009) *Oestrus ovis* causing human ocular myiasis: From countryside to town centre. *Clin Exp Ophthalmol* 37(3): 327-328.
10. Basmacıyan L, Gabrielle PH, Valot S, Marc Sautour, Jean Christophe Buisson, et al. (2018) *Oestrus ovis* external ophtalmo myiasis: A case report in Burgundy France. *BMC Ophthalmol* 18(1): 335.

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