

A CASE OF EXTERNAL OPHTHALMOMYIASIS IN A DEPLOYED UK SOLDIER

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Abstract

Infestation of the eye by larval fly forms (ophthalmomyiasis) is rarely seen in the Western world. We present the case of a 21 year old British soldier who developed external ophthalmomyiasis during an operational tour of southern Afghanistan. This case report and discussion illustrates the potential for ophthalmomyiasis in personnel deployed to this theatre; the possibility of infestation without an identifiable episode of exposure; the importance of proper assessment and follow-up in order to identify sight-threatening complications; and the balance between optimal patient care and the risks inherent to casualty evacuation demanded by modern day stability operations.

Introduction

Myiasis is infestation by the larval forms (maggots) of dipterous flies, and eye involvement (ophthalmomyiasis) may be external, internal or orbital. External ophthalmomyiasis is infestation of the superficial periocular tissues, most commonly the conjunctiva [1] and usually due to infestation by larvae of the sheep nasal bot fly *Oestrus ovis* [2]. It is rare in Northern Europe but sporadic cases have been reported throughout the Middle East [3-8] and a seasonal variation with peaks in May and October/November has been noted in Jordan [9]. We report a case of external ophthalmomyiasis identified in an infantry soldier serving in Helmand Province and detail his management at a Role 1 facility.

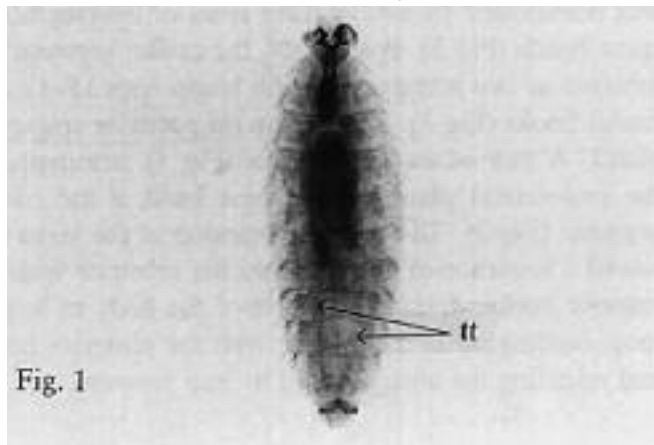


Figure 1. Whole larva (x40). *tt* indicates tracheal trucks. Reproduced with permission from Victor and Bhargva [6].

Case Report

An 18 year old British male infantry soldier presented to his medical officer in a 'platoon house' in the north of Helmand province, Afghanistan in October 2007. He reported irritation and the sensation of 'things moving' in his left eye over a twenty four hour period. Using a handmirror, he had observed several small, pale, motile organisms on the surface of the affected eye,

which transferred to his fingers on rubbing.

The soldier had been stationed in the platoon house for two weeks, and Afghanistan for six months with only a two week leave period in UK. He denied contacts with domestic animals during his operational tour and could recall no episodes of anything hitting his eyes in that period.

On examination, uncorrected visual acuity was 3/3 in both eyes. The inferior tarsal conjunctiva of the left eye showed a moderate follicular reaction and diffuse injection. Two organisms were found in the inferior fornix and were removed with a dampened cotton bud after applying amethocaine eye drops. The cornea was clear with no abrasions and no further abnormalities were found in the anterior segment or on non-dilated direct fundoscopy. On examining both the presented and the extracted organisms with the naked eye, they were found to be larval forms, between 0.5 and 1.0mm in length. They were immotile, white and semi-translucent, with a dark appendage on one pole.

He was prescribed oral mebendazole 200mg followed by 100mg twice daily for three days; oral metronidazole 400mg thrice daily was added after discussion with BMH Helmand. Ideally he would have been evacuated to the Role 2 facility for further evaluation but operational constraints prevented evacuation of a stable patient. He continued to shed immotile organisms for a further 48 hours. Subsequent assessment at BMH Helmand four weeks after presentation and ophthalmological review in UK were both unremarkable.

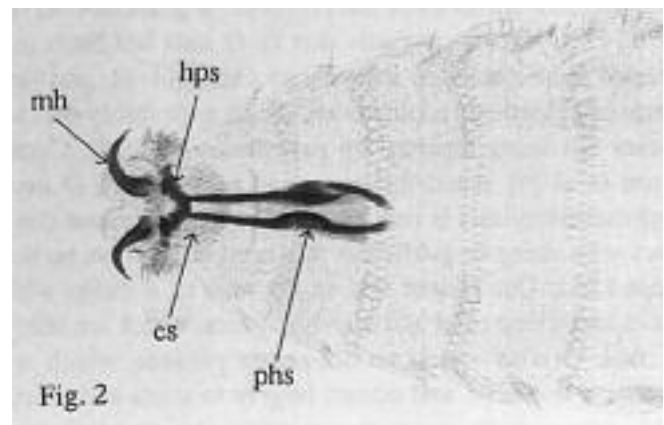


Figure 2. Anterior region of the larva (x100). *mh* indicates mouth hook; *hps*, hypopharyngeal sclerite; *psh*, pharyngeal sclerite; *cs*, collar spines. Reproduced with permission from Victor and Bhargva [6].

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Discussion

Oestrus ovis is a parasite of the nasal cavities of domestic sheep and goats [3]. The gravid female fly swarms around the head of the host and ejects first instar larvae in a milky stream onto the host's nostrils, which migrate to the paranasal sinuses and mature to second and third instar larvae, after which they fall to the ground and pupate [10]. Humans are not a suitable intermediate host and in human infestation, larvae cannot progress beyond the first stage and die within ten days without invading the orbit or globe [11].

Conjunctival ophthalmomyiasis may result from infestation by the horse nasal bot fly (*Rhinoestrus purpureus*) and the moose (elk) throat bot fly (*Cephenemyia ulrichii*) as well as the more common *Oestrus ovis* [12]. Larvae of *O. ovis* are translucent and small (0.8 to 1.0mm). They possess dark mouth claws and make active vermiform movements against the conjunctiva, aiding identification (Figure 1-3). They can be difficult to detect and, although slit lamp examination may help visualisation, they often avoid the beam [13]. Up to 60 organisms have been reported in one eye [6]. Both eyes may be affected.

Human ophthalmomyiasis frequently occurs without history of livestock exposure [14], but affected individuals may recall an insect or the sensation of a foreign body striking the eye a few hours before the onset of symptoms [15]. Symptoms include pain, irritation, redness lid swelling, the feeling of movement or pressure, lacrimation, discharge, photophobia and blepharospasm.

Signs in conjunctival ophthalmomyiasis are related to mechanical trauma by the larvae and the inflammatory response to them. Small conjunctival haemorrhages may result from the action of the anterior mouth claws. Corneal erosions may also be present. There is conjunctivitis which may be mucopurulent with palpebral oedema and blepharospasm [10]. Inflammation may be sufficiently severe as to mimic orbital cellulitis [16]. The severity of symptoms is not correlated with the number of larvae found in the eye [10].

Treatment is by manual removal of the larvae using forceps or a cotton bud [9]. This may be aided by prior topical application of 4 or 5% cocaine solution to paralyse the larvae [3] or pilocarpine 4% ophthalmic ointment which slows their movement [9]. Alternatively, the application of paraffin oil or ophthalmic antibiotic ointment [18], with or without an eye patch [12], deprives the larvae of oxygen. They die within hours and are extruded or irrigated out of the eye. Topical antibiotics may serve to prevent bacterial contamination and topical corticosteroids have been used to relieve acute inflammation [3].

External ophthalmomyiasis may progress to internal or orbital ophthalmomyiasis. In internal ophthalmomyiasis larvae

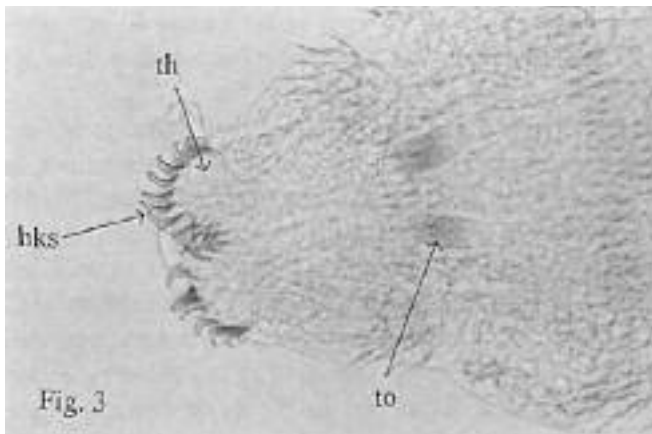


Figure 3. Posterior region of the larva (x200). *th* indicates terminal hump; *bks*, hooks; and *to*, terminal opening of the pharyngeal trunk. Reproduced with permission from Victor and Bhargva [6].

invade the globe and may be visualised in the vitreous and subretinal space, producing vitreous haemorrhage, tractional retinal detachment and endophthalmitis [19]. Orbital ophthalmomyiasis is the least common of the three clinical syndromes and describes invasion of the orbit, with severe ocular damage.

Our case represents the third case of external ophthalmomyiasis in UK soldiers in Afghanistan [20]. It was most likely caused by infestation with *O. ovis*. The size, appearance and motility of the larvae, and the fact that the larvae died within the first few days of infestation, without treatment to asphyxiate them, support this assumption, but given the potentially blinding consequences of infestation by the larvae of other organisms, it would have been desirable to obtain an entomological opinion on the extracted larva. However, the lack of an appropriate preservative medium at Role 1 made this impractical. If further cases declare themselves then telemedicine may be a useful adjunct to entomological confirmation that soldiers are not being exposed to the more dangerous forms of ophthalmomyiasis in Afghanistan, which have been reported to progress to internal and orbital ophthalmomyiasis in nearby India and Pakistan [21-24].

This case highlights the problems of managing unusual tropical conditions in austere environments without optimal equipment, such as a slit lamp, and without direct access to evacuation because of operational imperatives. Clearly if the patient's clinical condition deteriorated then this decision could have been reviewed. Subsequent follow up by an ophthalmologist is recommended [25]. Protection against disease transmission by insect vectors provides a further rationale for the use of issued protective eyewear [26].

Conclusion

We present a case of external ophthalmomyiasis encountered at a Role 1 facility in southern Afghanistan, which highlights the problems of treating uncommon tropical conditions with limited equipment. This soldier had an excellent outcome after Role 1 treatment, but we emphasise the importance of early diagnosis and appropriate follow up to identify and prevent the potential complications of external ophthalmomyiasis.

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