



## Myiasis of the exenterated orbital cavity: Case report and video

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### ABSTRACT

**Purpose:** We present an unusual case of myiasis involving the orbital cavity.

**Observations:** Our patient had undergone orbital exenteration one month prior to presentation. Post-operatively, he presented with multiple, highly mobile larvae in the orbital cavity. The species was identified to be *Lucilia sericata*, known commonly as the blowfly. The maggots were removed mechanically.

**Conclusion and Importance:** The orbital cavity subsequently healed rapidly without sequelae. This raised the question as to whether *L. sericata* maggots may have had beneficial effects to the healing process.

### 1. Introduction

“Myiasis” refers to an infestation of a mammal by dipterous larvae.<sup>1</sup> We present a case of right orbital cavity myiasis in a patient who had recently undergone total exenteration for recurrent conjunctival melanoma with orbital involvement. The larvae were subsequently identified as the *Lucilia sericata* fly.

### 2. Case report

A 79-year-old male patient was referred to the Oculoplastic service of Laval University Medical Center in Quebec City for recurrent melanoma with orbital involvement. He underwent total orbital exenteration and the cavity was reconstructed with a split-thickness skin graft harvested from the thigh. The initial post-operative course was uneventful. The orbital cavity was packed with a sterile non-adhesive dressing and the patient was discharged. The dressing was changed two times a week by nursing staff. No signs of necrosis or infection of the skin graft were noted at that time. However, one month after surgery, he presented to the emergency room complaining of irritation and a tingling sensation in the orbital cavity. On questioning, the patient reported walking frequently in the woods with no dressing covering the operated cavity. Numerous live maggot larvae were observed in the orbital apex (Image 1). The larvae were cream-colored, 10mm in length and observed to be moving vigorously. The foramen of the apex was not accessible for direct examination, however some of the organisms appeared to be moving underneath the skin graft (Video).

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### 3. Treatment

The orbital cavity was debrided and the larvae were mechanically extracted. Intravenous antibiotic therapy consisting of Meropenem was selected empirically and administered as prophylaxis for bacterial CNS infection. No antiparasitic treatment was given. A dressing soaked in povidone-iodine solution 10% was placed in the cavity. Orbital MRI showed diffuse non-specific inflammation of the apex without signs of posterior extension (Image 2). The patient was discharged 5 days later with complete resolution of the larval infestation. On follow-up 2 months later, the orbital cavity was well-healed.

In an effort to identify the insect species, the larvae were sent to the Department of Entomology, Montreal Insectarium for analysis. The maggots were identified to be the larvae of the *Lucilia sericata* fly.

### 4. Discussion

*Lucilia sericata* is found in Europe and North America and is commonly referred to as the blowfly or common green bottle fly. This common fly species belongs to the family of Calliphoridae of the sub-section Calyptratae. It habitually feeds on necrotic tissue and is known to lay eggs in mammalian tissues.<sup>1</sup> According to a prospective study of wound myiasis in the United States, *L. sericata* was the causal agent in 71% of the patients.<sup>2</sup>

Kalamkar et al. have previously reported myiasis involving an eviscerated socket.<sup>3</sup> This patient, to our knowledge, is the first report of

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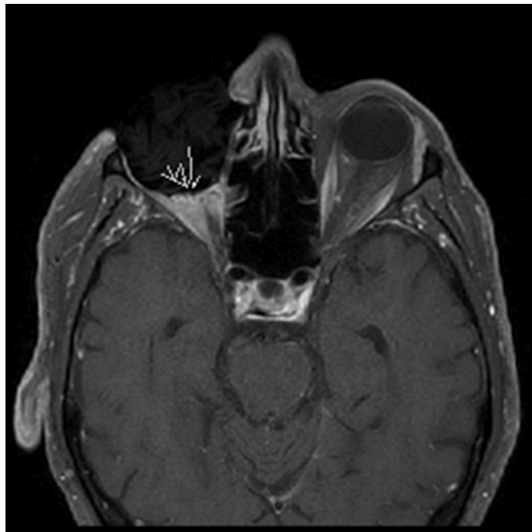
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**Image 1.** Numerous larvae of *L. sericata* observed in the orbital apex.



**Image 2.** Orbital MRI showed diffuse non-specific inflammation of the apex without signs of posterior extension.

myiasis as a post-operative complication of orbital exenteration.

At two-month follow-up, the orbital cavity was fully re-epithelized indicative of a rapid healing process. We conjecture that the *L. sericata* larvae may have had certain therapeutic benefits, although this hypothesis would require further investigation.

Gericke et al. reported their positive experience using ‘‘maggot therapy.’’ The patient presented developed post-operative infection following full exenteration of the left orbital cavity. Despite several attempts of antibiotic therapy, his condition did not improve. The authors describe placing 50 *L. sericata* maggots in a nylon bag in the orbital cavity to accelerate healing. The nylon bag prevented the larvae from escaping whilst enabling them to be in contact with the wound secretions. The authors noted a complete absence of purulent secretions after two changes of the bag at 4-day intervals.<sup>4</sup> Our present case coincidentally involves the same insect species. Unlike Gericke, our maggots

were freely roaming in the orbital apex. Despite our initial concerns of posterior migration through the orbital foramina, no intra-cranial involvement was observed on the MRI.

The beneficial effects of larvae were initially observed by military physicians in soldiers with serious deep tissue wounds. In the years prior to the arrival of antibiotics, maggot therapy gained in popularity and successful trials were carried out in patients with osteomyelitis.<sup>6</sup> The U. S. Food and Drug Administration (FDA) approved maggots *Lucilia sericata* as a medical device in 2004 for treatment of non-healing wounds such as pressure ulcers, venous stasis ulcers, neuropathic foot ulcers, traumatic or post-surgical wounds.<sup>5</sup> The maggots chosen for approval needed to feed predominantly on necrotic tissue without affecting healthy tissue. The mechanisms by which larvae of the common green bottle fly participate in wound healing include mechanical debridement in addition to secretion of proteolytic enzymes. The conversion of the necrotic tissue into liquid by the enzymes facilitates drainage or its ingestion by the larvae. Maggots equally exert antibacterial effects by consuming bacteria from the necrotizing tissue and by secreting ammonia thereby alkalizing the wound.<sup>6</sup> In addition, Bowling et al. reported promising results when using *L. sericata* larvae to eradicate MRSA from diabetic foot ulcers.<sup>7</sup>

#### 4. Conclusion

We report a rare case of an orbital cavity myiasis after the exenteration of the right eye of a 79-year-old patient. The larvae were identified as belonging to *Lucilia sericata*. This species has been frequently reported in human myiasis, but very infrequently in the ophthalmic literature. The patient was treated with mechanical debridement, healed properly and the condition did not recur.

#### Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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#### Intellectual property

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

#### Research ethics

We further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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