Case report

Massive orbital myiasis arising from nasal myiasis in an Indonesian patient with diabetes

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ABSTRACT

Purpose: Orbital myiasis is a rare condition. We report a case of massive orbital myiasis (ophthalmomyiasis profunda) arising from nasal myiasis and caused by Chrysomya bezziana in a patient with diabetes.

Observations: A 55-year-old woman presented with massive orbital myiasis from larvae invading the entire orbit, with only a small part of sclera and bulbar conjunctiva left of the ocular structures left unaffected. The patient complained of breathing difficulty and drooping of the left eyelid with no other significant complaints. Computed tomography of paranasal sinuses was performed to determine the extent of intraocular invasion of larvae and the surrounding area that might be involved. The larvae filled the nasal and orbital cavity with bony destruction. The patient had a history of diabetes mellitus with uncontrolled blood sugar.

Conclusions and importance: Orbital myiasis is an infestation of any anatomical structure of the orbit with larvae from the order Diptera. To our knowledge, this is the first reported case of massive orbital myiasis arising from nasal myiasis caused by C. bezziana in a patient with diabetes. Eliminating the causative larvae and topical treatment with antibiotics eye ointment therapy improved the patient's symptoms. Epidemiological data are required to improve documentation of the incidence rate of myiasis.

1. Introduction

The term “myiasis” derived from Greek (mya, or fly) was first mentioned by Hope in 1840 to describe human diseases caused by dipterous larvae. 1 In 1990, Keyt reported human ophthalmomyiasis, and 10 years later, Elliot reported the same case. 2 Human myiasis was mostly reported in poor socioeconomic regions and tropical and subtropical countries with poor hygiene, and less than 5% of cases involved the eye. 3 Myiasis was classified into 2 categories: anatomical and ecological. Francesconi and Lupi classified the anatomical classification that is based on Bishopp's, James's, and Zumpt's classifications: sanguinivorous or bloodsucking, cutaneous myiasis, furuncular and migratory, wound myiasis, and cutaneous myiasis. Cutaneous myiasis included cerebral myiasis, aural myiasis, nasal myiasis, and ophthalmomyiasis; ophthalmomyiasis is classified into ophthalmomyiasis externa (superficial, larvae attack the conjunctiva) and ophthalmomyiasis interna (invade the globe, and anterior and posterior segments of the eyeball). Orbital myiasis (ophthalmomyiasis profunda) is a severe clinical variant of ophthalmomyiasis and causes serious damage (pericocular, eyelid, and intraocular) and bone destruction. 4 Here, we report a rare case of massive orbital myiasis arising from nasal myiasis in an Indonesian patient with diabetes. (see Fig. 6)

2. Case report

A 55-year-old woman was admitted to the emergency unit of Royal Prima General Hospital, Indonesia, with complaints of breathing difficulties and drooping of the left eyelid since 2 weeks. The patient did not have any significant history of eye pain, itch, or red eyes and had no complaints with respect to her left eye until she realized that her left upper eyelid was drooping. She often experienced breathing difficulties and, therefore, used a nasal inhaler. The patient had a history of uncontrolled diabetes mellitus for 15 years, and she reported that her previous blood sugar level was 700 mg/dl.

Examination of the left eye revealed ulcers and necrotic tissue involving the upper and lower eyelid, erythema, slight periorbital edema, and induration. The thickness of the left upper eyelid near the medial canthus was completely lost. The only visible part of the left eye was a small part of the sclera and bulbar conjunctiva. The orbital wall could not be identified because of numerous live white and shiny larvae crawling over the fleshy mass (Fig. 1). We manually removed 50 larvae from the left eye and nostril with forceps. Furthermore, debridement of
the necrotic tissue was performed in an emergency room under topical anesthesia (pantocaine 2% eye drops). We diagnosed the patient as having massive orbital myiasis. The larvae were stored in a saline solution for further investigation (Fig. 2). All the larvae could not be removed in a single sitting as they kept invading the remaining ocular tissue and nasal cavity. Computed tomography of the sinus paranasal of the coronal section showed pansinusitis, visible cloaking, shadow abscess, and presumed insects filling the left maxillary and ethmoidal sinuses and nasal cavity and reaching the left orbital cavity accompanied with bone destruction (left maxillary and ethmoidal sinuses wall) and nasal septum destruction (Fig. 3). Chest X-ray revealed right pleuroneumonia. The patient was hospitalized for further treatment and co-treated by the Ear, Nose, and Throat and Internal Medicine Department. The larvae were identified as *Chrysomya bezziana* (Fig. 4). Complete larvae removal from nasal and orbital cavities was done through nasal endoscopy. Intravenous antibiotic (ceftriaxone 1 gr/12 h), chloramphenicol eye ointment, and nasal decongestant drops improved the patient symptoms, and insulin glulisine 12-12-12 helped the patient control the blood sugar level. The patient was discharged from the inpatient ward after a successful removal of the larvae (see Fig. 5).

3. Discussion

Myiasis epidemiological data are difficult to obtain; however, in this case, we were able to identify the invading parasite. This patient was highly suspected to have experienced an initial nasal myiasis that proceeded toward the orbit, because most cases of myiasis occur first in the nasal region. Nasal myiasis arises from either oviposition in the nasal cavity or the surrounding surface; patients are usually unaware of this development as it mostly occurs while they are asleep. Our patient experienced no symptoms, encouraging the massive breeding of maggots until she experienced breathing difficulties and sought medical treatment. Dipterous flies are parasites that cause myiasis in humans. Diptera is a large order of insects commonly known as true flies, and
this order is divided into two suborders: Nematocera and Brachycera. Brachycera comprises infraorders; the infraorder Muscomorpha or Cyclorrhapha contains all species that cause specific myiasis and are responsible for facultative myiasis, particularly the species within the taxon Calyptratae.4

Ophthalmomyiasis is a very rare and uncommon ocular disease that accounts for only 5–14% of all cases of human myiasis.6,7 The most common form of ophthalmomyiasis is external ophthalmomyiasis. Orbital myiasis is a rare form of ophthalmomyiasis and has rarely been reported worldwide. Ophthalmomyiasis is most common in rural areas of developing countries, particularly countries in tropical and subtropical regions with a hot climate. The risk factors for myiasis are open wounds, supplicative lesions, scabs, traumatic wounds, and ulcers contaminated with discharges and blood remnants, and the risk

Fig. 4. Paranasal CT-Scan showed insects in the left maxillary and ethmoidal sinuses, nasal cavity and left orbital cavity. Bone destruction (left maxillary and ethmoidal sinuses wall) and nasal septum destruction were also identified.
increases with debilitation, mental or physical disability, and presence of poverty.\textsuperscript{8} \textit{C. bezziana} of the family Calliphoridae is an obligatory parasite and has the ability to penetrate deep tissue, even when the tissue is normal and healthy. Complete destruction of the globe can occur rapidly, often within a few days.\textsuperscript{9}

Although humans are not a definite host of this parasite, \textit{C. bezziana} is known to occasionally inhabit human living tissue.\textsuperscript{10} This case illustrates the destruction of orbital tissues by \textit{C. bezziana} in an elderly woman with diabetes. Poor control of longstanding diabetes is suspected to have predisposed this patient to larval habitation owing to diabetic neuropathy. We hypothesize that the larvae first infested the patient’s nasal cavity while the patient was asleep and then infested the nasal lining. The massive larval breeding of spread into the maxillary sinus, destroying the ethmoidal sinus and invading the orbital region. The patient never felt any discomfort owing to severe neuropathy. Meticulous complete manual removal of infesting larvae with proper subsequent management will prevent further tissue damage.\textsuperscript{8}

4. Conclusion

Orbital myiasis is a very rare condition, but a very scant number of cases can still be observed. Indonesia has a relatively high poverty rate, poor health control, and poor hygiene, and \textit{C. bezziana} is widely found in this country. Ophthalmologists must be cautious of cases of myiasis having these risk factors. A complete epidemiological survey of myiasis in a country with multiple risk factors will help in better management and prevention of such cases of myiasis.

Patient consent

The patient provided written consent to publish the case.

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Disclosure

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Authorship

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajoc.2019.01.006.

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Fig. 5. Gross appearance of the larva extracted from the left orbit. (B) Parasitologic examination revealed the larvae to be Chrysomya bezziana (marker points toward posterior spiracle of the larva).

Fig. 6. Post-treatment of the myiasis.
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