International Journal of Surgery Case Reports 94 (2022) 107108

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

Otomyiasis caused by *Musca domestica* in a child: A case report

Makram Tbini [a,b,*], Habib Jaafoura [a,b], Marwen Ghabi [a,b], Ezer Chebil [a,b], Mamia Bensalah [a,b]

[a] ENT Department, Charles Nicolle Hospital, Boulevard du 9-Avril 1938, 1006 Tunis, Tunisia
[b] Faculty of Medicine of Tunis, University Tunis el Manar, Tunisia

ARTICLE INFO

Keywords:
Myiasis
Ear
Children
Musca domestica

ABSTRACT

Introduction: Myiasis is the infestation of humans and vertebrate animals with dipterous larvae. It is a rare clinical condition, mainly observed in vulnerable people living in tropical and subtropical regions.
Case presentation: We reported a 2-year-old boy, with history of anemia and psoriasis who was admitted to our department after discovering larvea coming out from the left ear 6 weeks ago. Ear examination revealed a few maggots in the left concha and external auditory canal. A larvea was removed and identified as *Musca domestica*. Management of this otomyiasis was based on manual maggot removal and regular auditory toilets with povidone iodine.
Discussion: Although rarely reported, clinicians should still suspect aural myiasis in the event of an unexplained otalgia in children, mainly if they are from rural area with poor hygienic conditions.
Conclusion: Otomyiasis is mainly reported in tropical rural location in debilitated individuals with low socio-economic conditions and poor hygiene. Thus prophylactic measures are the most effective means to reduce its incidence.

1. Introduction

The term “myiasis” comes from the Greek word “mya” meaning fly. Myiasis can be defined as the infestation of humans and vertebrate animals with dipterous larvae. Those larvae will feed in on the host's necrotic or living tissue, liquid body substances, or ingested food causing a wide range of symptoms depending on the affected organ and the relationship of the larvae with the host [1].

Human myiasis is a rare clinical condition primarily seen in vulnerable people living in tropical regions [2].

In the head and neck region, myiasis can affect the eyes, ears, mastoid region, nasal cavity, paranasal sinus, oral cavity, lymph nodes and tracheostomy wound [3].

Aural myiasis or otomyiasis happens when a female fly attracted by the foul odor deposits its eggs in the external ear canal. It is commonly caused by larvae from *Sarcophagidae* and *Calliphoridae* families. *Muscidae*'s family is rarely involved [2,4].

This article has been reported in line with SCARE criteria [5].

2. Case report

A 2-year-old boy, with history of anemia and psoriasis, was admitted to our department after discovering larvea coming out from the left year 6 weeks ago. There was no history of fever, otalgia, otorrhea, vertigo or facial asymmetry.

Ear examination revealed several pupae and larvae over the left concha and in the left external auditory canal (Fig. 1).

General clinical examination, vital signs and right ear were all normal.

A specimen was removed and identified by the biologist to belong to the *Muscidae* family and *Musca domestica* specie.

A CT scan was performed to rule out mastoid or cerebral extension and was normal.

Manual maggot removal and regular auditory toilets with povidone iodine were performed.

Thus, the larvae disappeared and the local condition of the ear improved.

3. Discussion

Myiasis is the infestation of a living vertebrate host by dipterous larvae [1].

In order to understand the mechanism of the infestation and therefore to advance preventive measures it is important to make the

* Corresponding author at: ENT Department, Charles Nicolle Hospital, Boulevard du 9-Avril 1938, 1006 Tunis, Tunisia.
E-mail address: makramtb@yahoo.com (M. Tbini).

https://doi.org/10.1016/j.ijscr.2022.107108
Received 17 March 2022; Received in revised form 14 April 2022; Accepted 15 April 2022
Available online 20 April 2022

adequate identification of the larvae. Myasis are categorized according to the anatomical, entomological or ecological classification.

The first classification, depends on the location of the disease, in fact the infection can concern many organs such as the oral cavity, the nose, the ear, the eye, the skin and wounds, the gastrointestinal system and the urogenital system [1,6].

The second classification is based on the causative fly family; blowflies (Calliphoridae), flesh flies (Sarcophagidae) and botflies (Oestridae, Gasterophilidae, Hypodermatidae, Cuterbridae) are the most reported in humans while Muscidae and Phoridae are less common [6].

The ecological classification considers the relationship between the parasite and the host during his life cycle, thus myiasis can be classified as obligatory myiasis, facultative myiasis or accidental myiasis [1].

Usually, flies from the Sarcophagidae and Calliphoridae families cause otomyiasis [2,4]. And to our knowledge, only few cases of otomyiasis caused by *Musca domestica* were reported (one patient from India and two from Turkey) [2,4,7].

Otomyiasis is mainly reported in rural location especially those with warm and humid climates. It is commonly seen in children, diabetics, and people with intellectual disability or in debilitated individuals especially with low socioeconomic conditions and poor hygiene. Another predisposing condition for the onset of the infestation is chronic suppurative otorrhea that attracts and stimulates eggs or larvae deposition [6,8].

Clinical presentation of otomyiasis is variable. It may include one or several symptoms like otalgia, otorrhea, bleeding, tinnitus, itching, foreign body sensation and altered hearing. Otoscopy can reveal maggots, inflammation and swelling of the ear canal, and sometime a perforation of the tympanic membrane [9].

Further investigations such as computed tomography, are indicated to assess possible complications like invasion and destruction of the mastoid cavity and intracranial extension even though no cases of intracranial myiasis of otogenic origin have been reported [10]. Given the possibility of hearing loss, auditory function exploration is necessary when the patient report hearing loss [10,11].

Manual removal of the larvae whenever is possible is an important

Fig. 1. Pupae over the left concha.

step of the treatment plan. In order to facilitate larvae removal authors have also reported the use of various solutions drops such as ethanol, normal saline, chloroform, oil, ivermectin or iodine. Prophylactic antibiotic treatment to prevent possible secondary infections was also prescribed in some cases. Surgical interventions for complete larvae extraction may be required in some cases especially those with middle ear involvement [8,12]. This variety of treatments points out the lack of standard protocol [3].

Close follow-up and respect of hygienic measures are important for resolution of the infestation, as well as to prevent serious complications, and recurrence of the infestation.

4. Conclusion

Although rarely reported, clinicians should still suspect aural myiasis in the event of an unexplained otalgia in children, mainly if they are from rural area or with poor hygienic conditions. Prophylactic measures, such as fly population control, maintaining a good personal and environmental hygiene and proper wound management, are the most effective means to reduce the incidence of these infestations.

Sources of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

This study is exempt from ethical approval at our institution.

Consent

Written informed consent was obtained from the patient's parents for publication of this case report and accompanying image. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Makram Tbini: Writing - Original Draft.
Habib Jaafoura: Writing - Review & Editing.
Marwen Ghabi: Writing - Original Draft.
Ezer Chebil: Supervision.
Mamia Bensalah: Supervision.

Registration of research studies

Not applicable.

Guarantor

Makram Tbini.

Declaration of competing interest

The authors report no declarations of interest.

References

[1] F. Francesconi, O. Lupi, Myiasis, Clin. Microbiol. Rev. 25 (1) (2012) 79–105.
[2] M.T. Rodriguez-Ruiz, A.M. Acosta, E. Cifuentes-Cardozo, M.A. Chirveches, D. Rosselli, Otomyiasis: systematic review, Int. Arch. Otorhinolaryngol. 23 (1) (2019) 104–109.
[3] J.A.A. de Arruda, L.V. de Oliveira Silva, P.U.J. Silva, E.L. de Figueiredo, G. Callou, R.A. Mesquita, et al., Head and neck myiasis: a case series and review of the literature, Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod. 124 (5) (2017) e249-e56.
[4] J. Jervis-Bardy, N. Fitzpatrick, A. Masood, G. Crossland, H. Patel, Myiasis of the ear: a review with entomological aspects for the otolaryngologist, Ann. Otol. Rhinol. Laryngol. 124 (5) (2015) 345–350.
[5] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, Group S, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[6] A. Singh, Z. Singh, Incidence of myiasis among humans-a review, Parasitol. Res. 114 (9) (2015) 3183–3199.
[7] Z. Iqbal, S. Sharma, H. Sami, A. Kumar, Unusual pseudomyiasis with Musca domestica (housefly) larvae in a child with chronic otitis media, Indian J. Otol. 22 (2) (2016) 132.
[8] K. Ponnuvelu, J. Saniasiaya, Gani N. Abdul, Something is crawling in my ears, Eur. Ann. Otorhinolaryngol. Head Neck Dis. 138 (6) (2021) 505–507.
[9] E. Rummens, G. Van der Mieren, V. Van Rompaey, P. Piessens, F. Somville, Aural myiasis: a case report on a rare entity, Cureus 12 (9) (2020), e10617.
[10] J. Kahane, C. Longworth, C. Dickson, M. Ng, Mastoid cavity myiasis: a case report and review of the literature, Otol. Neurotol. 40 (6) (2019) e627-e30.
[11] A.A. Al-Abidi, C. Bello, M. Al-Ahmari, Y. Fawehinmi, Mastoid cells myiasis in a saudi man: a case report, West Afr. J. Med. 22 (4) (2003) 366–368.
[12] S. Gour, G. Ramesh, V. Kumar, G.K. Thapliyal, R. Nagarajappa, Cavitary myiasis and its management, J. Exp. Ther. Oncol. 12 (3) (2018) 211–216.