

Aural and Nasal Myiasis

Kulak ve Burun Miyazisi

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ABSTRACT Objective: Myiasis is a parasitic infestation by fly larvae. It is usually associated with poor hygienic conditions. Most of the literature consists of individual case reports or short case series. In this study, we report eight cases of myiasis who present with aural or nasal symptoms. **Material and Methods:** It's a retrospective study included 8 patients with ear, nose and throat myiasis diagnosed over a 9-year period, from 2013 to 2022. **Results:** The study included 6 male and 2 female patients, aged from 9 to 84 years. Two patients were bedridden. There were 6 cases of aural myiasis and 2 of nasal myiasis. All of the patients with aural myiasis had a history of chronic otitis media. A patient with nasal myiasis had a nasogastric tube as a predisposing factor. In the other case of nasal myiasis, there was no comorbid disease, there was a history of ocular myiasis. For the treatment of myiasis infection, all maggots were cleaned one by one with a microscope or endoscope. No reinfection was observed in patients followed up for 1 month. **Conclusion:** Otorhinolaryngologic myiasis is very rare and mostly seen as an ear infection. Especially for aural myiasis, suppurative otitis can be a predisposing factor. Diagnosis is often easy. Myiasis should be kept as one of the possible diagnoses in patients with otitis media and in patients with long-term nasal tubes. Treatment of this parasitic infection is resection of maggots.

ÖZET Amaç: Miyaz, sinek larvaları tarafından oluşturulan parazitik bir enfeksiyondür. Genellikle kötü hijyenik koşullarla ve zayıflamış bağışıklıkla ilişkilidir. Literatürün çoğu bireysel vaka raporlarından veya kısa vaka serilerinden oluşmaktadır. Bu çalışmada, kulak veya burun semptomları gösteren 8 miyazis olgusu sunulmuştur. **Gereç ve Yöntemler:** Bu retrospektif çalışma, 2013 yılından 2022 yılına kadar 9 yıllık süre içinde tanı, tedavi ve takibi yapılan, birbirinden farklı semptomlarla başvuran 6 kulak ve 2 burun miyazis hastasını içermektedir. **Bulgular:** Çalışmaya yaşları 9 ile 84 arasında değişen 6 erkek ve 2 kadın hasta dâhil edilmiştir. İki hasta yatağa bağımlı bakım hastasıydı. Kulak miyazisli hastaların hepsinde kronik otitis media öyküsü vardı. En sık görülen semptom kanlı kulak akıntısıydı. Ağrı ve kaşıntı eşlik eden diğer semptomlardı. Burun miyazisli bir hastada predispozan faktör olarak nazogastrik tüp vardı. Diğer burun miyazis olgusunda eşlik eden bir hastalık yoktu, geçirilmiş oküler miyazis öyküsü vardı. Miyazis enfeksiyonunun tedavisi için tüm larvalar mikroskop veya endoskop ile tek tek temizlenmiştir. Bir ay boyunca takip edilen hastalarda yeniden enfeksiyon gözlenmemiştir. **Sonuç:** Kulak burun boğaz miyazisi çok nadirdir ve çoğunlukla kulak enfeksiyonu şeklinde görülür. Özellikle kulak miyazisi için süpüratif otit predispozan bir faktör olabilir. Teşhis genellikle kolaydır. Miyazis, orta kulak iltihabı olan hastalarda ve uzun süreli nazogastrik tüpü olan hastalarda olası tanımlardan biri olarak tutulmalıdır. Bu parazit enfeksiyonunun tedavisi larvaların rezeksiyonudur.

Keywords: Infectious diseases;
otitis media; rhinitis; myiasis

Anahtar Kelimeler: Enfeksiyon hastalıkları;
otitis media; rinit; miyazis

TO CITE THIS ARTICLE:

Güllüev M, Ata N, Öztürk K, Özbuğday Y, Koç E, Görgülü MH. Aural and Nasal Myiasis. Journal of Ear Nose Throat and Head Neck Surgery. 2024;32(1):45-50.

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Peer review under responsibility of Journal of Ear Nose Throat and Head Neck Surgery.

Received: 06 Oct 2023

Received in revised form: 22 Nov 2023

Accepted: 22 Nov 2023

Available online: 07 Dec 2023

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For the video/videos of the article:



Video 1: Endoscopic view of nasal myiasis of case-5.

For the video/videos of the article:



Video 2: Endoscopic view of aural myiasis of case-6.

Myiasis is a parasitic infestation by fly larvae. Infections caused by these fly larvae can take 2 forms: primary (obligatory) and secondary (facultative). Although many parasites prefer open or superficial wounds to live, there are also varieties of larvae that can live in healthy tissues.^{1,2} Many fly families have been reported previously in aural myiasis, and the most common type of myiasis in aural myiasis is the obligatory parasite *Wohlfahrtia magnifica*. These larvae can destroy undamaged healthy tissues, deepen in tissue layers, and cause advanced infections.³

Myiasis infections are more common in tropical and subtropical regions. In addition, the incidence is high in people living in rural areas, low socioeconomic status, inadequate personal hygiene or immunocompromised. It is located in anatomical areas such as eyes, skin, ears, nose, oral cavity, lungs, vagina, and anus that come into contact with external surfaces.^{4,5} Aural and nasal myiasis are very rare ear, nose, and throat (ENT) infections.⁶

Aural myiasis usually develops on the background of chronic otitis media. It causes symptoms such as ear pain, ear discharge, bleeding, ear fullness, tympanic membrane perforation, and hearing loss.^{3,7} Nasal myiasis causes complaints such as nasal discharge, epistaxis, itching, and nasal congestion.⁸ Diagnosis of aural myiasis can be easily made by detecting maggots in the external auditory canal in otoscopic or endoscopic examination.³ However, they may be more difficult to find in nasal myiasis, especially if the maggot number is low.⁶

There is no specific treatment method in the treatment of myiasis. Often removal of maggots from infected tissue is sufficient for treatment. Oral or topical antibiotics can be used to prevent superinfections.⁷⁻⁹

In this study, we aimed to share our experience in these rare cases of infection and increase the knowledge on this subject by presenting cases of otolaryngological myiasis that we encountered in our clinic.

MATERIAL AND METHODS

This research was prepared as a retrospective review covering the years March 2013 and November 2022.

Eight patients who presented with various symptoms and were diagnosed with aural or nasal myiasis by ENT clinicians were included in the study. Patients' demographic information, clinical features, and other diseases that may be associated with myiasis, treatment methods, and follow-up processes were noted. Patients who were diagnosed with myiasis but whose necessary information could not be obtained were not included in the study.

This study was approved by the KTO Karatay University Faculty of Medicine Drug and Medical Non-Device Researchs Ethics Committee (date: July 8, 2021, no: 2021/014). Our study was carried out in accordance with the Declaration of Helsinki.

RESULTS

This study included 8 participants (2 females and 6 males) aged between 9 and 84 (mean age 43.6) who were diagnosed with aural and nasal myiasis in our clinic between 2013 and 2022. Myiasis was detected in the ear of 6 patients and in the nose of 2 patients (Figure 1, Figure 2, Figure 3, Figure 4). The left ear was unilaterally infected in all of the patients with aural myiasis. The complaints of these patients were ear pain, bloody ear discharge, itching, and headache. All of the patients with aural myiasis had a history of chronic otitis media (4 active, 2 inactive-operated). The unilateral right nasal cavity of the patients diagnosed with nasal myiasis was infected. These patients have complaints of nasal discharge, itching, and sneezing. Nasal myiasis developed in one patient following the placement of a nasogastric tube and in the other following ocular myiasis (Video 1) (Table 1).

All myiasis maggots were cleaned one by one with a microscope in patients with aural myiasis, and

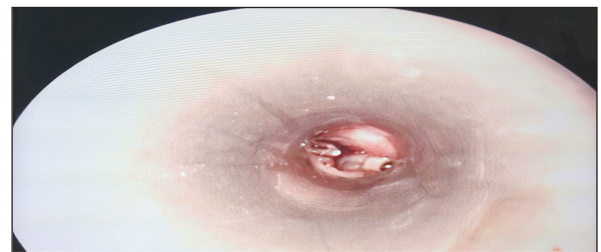


FIGURE 1: Otoscopic view of aural myiasis of case-2.



FIGURE 2: Endoscopic view of aural myiasis of case-7.

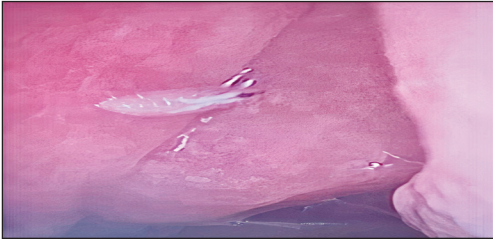


FIGURE 3: Endoscopic view of nasal myiasis of case-8.

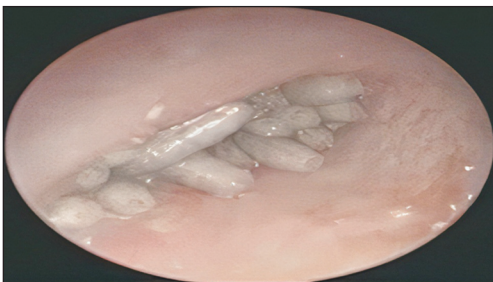


FIGURE 4: Endoscopic view of aural myiasis of case-6.

with an endoscope in patients with nasal myiasis (Video 2). The nasogastric tube of case-5 was removed from the right nasal cavity, and a new naso-

gastric tube was placed in the left nasal cavity. For case-8, ocular myiasis was screened by ophthalmology consultation, no new larvae were detected. Oral antibiotics were given to all patients for superinfection prophylaxis, and ciprofloxacin drops were given to patients with aural myiasis. No new myiasis larvae were observed in any of the patients in the controls performed after 10 days and 30 days.

DISCUSSION

Myiasis is the general name for infectious diseases caused by insect larvae in mammals. The larvae, which use the mammalian body as a host, lead a parasitic life by feeding on living or dead body tissues, body fluids, or nutrients entering the body. As they cause serious health and economic problems in husbandry, they can also cause various symptoms by localizing in different anatomical localizations in humans. Myiasis infections are more common in tropical and subtropical regions and communities with low socioeconomic status. With the increase in international travels, myiasis infections are also increasing.^{6,10}

Low socioeconomic status, poor personal hygiene, the patient's bedridden condition, psychiatric disease, humid climatic conditions, suppurative lesions that provide a suitable environment for female insect to lay eggs, habits of sitting and lying on the ground can be listed as predisposing factors for myiasis infections.¹¹ On the other hand, the incidence of dementia and Alzheimer's disease increases with the increase in the elderly population.

TABLE 1: Demographic and clinical description of ear, nose, and throat myiasis patients.

Case number	Age (year)	Sex	Location	Symptoms	Predisposing factors	Maggots count
1	37	M	Left ear	Bloody ear discharge, pain	20 years ago left radical mastoidectomy	5
2	9	F	Left ear	Bloody ear discharge, pain	Left chronic otitis media	4
3	84	M	Left ear	Bloody ear discharge	CVD, dementia, DM, bedridden, left chronic otitis media	9
4	29	M	Left ear	Itching, pain	15 years ago left radical mastoidectomy	3
5	79	M	Right nasal cavity	Bloody nasal discharge	Malnutrition, 10 days ago nasogastric tube placement	14
6	19	M	Left ear	Bloody ear discharge	Farmer, left chronic otitis media	27
7	58	M	Left ear	Pain, headache	DM, mental retardation, bilateral chronic otitis media	13
8	34	F	Right nasal cavity	Itching, serous nasal discharge, sneeze	10 days ago right ocular myiasis	1

DM: Diabetes mellitus, CVD: Cerebrovascular disease.

Parasitic infections such as myiasis can be seen in this group of patients due to reduced personal care and hygiene.¹²

The first classification on the basis of anatomical location was made by Bishopp, this classification and its modifications are still used today.¹³ Accordingly, when the infection localizations are examined, it is stated that dermal and subdermal tissues, intestine and urogenital organs, organs with high blood supply and head passages such as nose, ear, ocular etc. are infested.⁶

Myiasis cases located in the ear, nose, oral cavity, throat, larynx, tumor wound, tracheostomy, and trachea can be examined under the title of ENT myiasis. Etiological factors similar to other myiasis infections are also valid for ENT myiasis. Poor hygiene is the most important risk factor, however, suppurative lesions, poor mental health, trauma, foreign bodies, being younger than 10 years old or old age are other risk factors. The most common myiasis types in ENT myiasis are *W. magnifica*, *Cochliomyia hominivorax*, *Chrysomya bezziana*, and *Dermatobia hominis*.^{1,14}

Different symptoms are encountered in patients according to the infestation site. For diagnosis, it is essential to be conscious about myiasis infections. The appearance of larvae on examination is sufficient to make the diagnosis. No imaging method is required unless complications are suspected. Removal of all larvae is often sufficient for treatment. Washes such as saline, 70% ethanol, or 10% chloroform can be used to remove maggots.^{3,6} There are also publications recommending the use of ivermectin, a macrolide antibiotic, for 3 days following larval cleaning, at 6 mg/day orally.² Antibiotherapy may be required in some cases to prevent secondary infections. If diagnosis and treatment are delayed, serious complications such as intracranial spread, meningitis, and even death can occur.^{1,15}

In our study, 8 patients with ENT myiasis were examined. All of our aural myiasis patients had a diagnosis of chronic otitis media. Four patients had active ear discharge. The other 2 patients had an enlarged external auditory canal as a result of radical

mastoidectomy surgery years ago. In patients with large cavities associated with the external auditory canal, such as radical mastoidectomy or canal wall down mastoidectomy, cerumen accumulates in the cavity over time if regular cavity cleaning is not performed. This creates a moist environment in the cavity, and together with the debris formed by dead epithelial cells, it paves the way for ear infections. It was determined that these 2 patients underwent cavity cleaning several times after the operation, and then this cleaning was not performed for many years. Suppurative lesions are the settlement areas preferred by female flies to lay eggs. These lesions are highly favorable for feeding maggots. In addition, it is noteworthy that two of the aural myiasis patients had insufficient self-care and were in need of care.

In a literature review by Jervis-Bardy et al., 45 patients with aural myiasis were examined. In the vast majority of patients, maggots were found to settle in the external auditory canal, middle ear cavity and mastoid cavity, soft tissue invasion was detected in only 3 cases in the pre-auricular region.¹⁶ In the treatment of 42 patients without soft tissue invasion, removal of maggots with conservative methods and topical treatments were found to be sufficient. Cortical mastoidectomy surgery was performed in only 2 of these patients because mastoid cavity cleaning was required.

The first of our patients with nasal myiasis is an elderly patient in need of care. We think that the placement of a nasogastric tube 10 days ago in this patient's nose prepared an environment for infection due to the foreign body effect. In addition, non-compliance with the sterility rules while placing the nasogastric tube may be another complicating factor. Poor hygiene and food particles around medical tubes such as feeding tubes and nephrostomy tubes can become suitable places for larval flies to lay eggs. Similarly, in this case, the nasogastric tube may have a predisposing effect to myiasis infection by preparing a suitable living environment. This is the first case in the literature in terms of the development of nasal myiasis following nasogastric tube placement.

Our other patient with nasal myiasis is a young patient who developed nasal myiasis following ocular myiasis and did not have any predisposing factors. Ocular myiasis is more common than ENT myiasis. It occurs when flies that easily enter the eye lay eggs, and the presence of other etiological factors such as ENT myiasis is not essential for the development of infection. Anatomical neighborhood and connections after ocular myiasis may cause the development of nasal myiasis. Every patient with a diagnosis of myiasis in the head passages should be informed about adjacent organ invasions. In particular, nasal myiasis symptoms should be explained to every patient with ocular myiasis. In patients with these symptoms, endoscopic nasal examination should be performed to look for maggots.

CONCLUSION

Myiasis, a parasitic infection caused by maggots, is often seen in tropical areas and in people with low self-care. Otorhinolaryngologic myiasis is very rare conditions, and it is usually encountered as an ear infection, even though it can be seen in different places in the head and neck region. Aural myiasis is more common in patients with chronic otitis media and nasal myiasis should be considered if patients develop nasal symptoms after long-term retention of

feeding tubes in the nose or ocular myiasis. Diagnosis is easily made by seeing maggots on examination of the infected area. In the treatment, cleaning these maggots conservatively and topical treatments are sufficient.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Mustafa Güllüev, Nurdoğan Ata; **Design:** Nurdoğan Ata, Yaşar Özbuğday; **Control/Supervision:** Kayhan Öztürk, Mustafa Güllüev, Mehmet Hakan Görgülü; **Data Collection and/or Processing:** Mustafa Güllüev, Kayhan Öztürk, Ersen Koç; **Analysis and/or Interpretation:** Nurdoğan Ata, Ersen Koç; **Literature Review:** Mustafa Güllüev, Yaşar Özbuğday, Mehmet Hakan Görgülü; **Writing the Article:** Mustafa Güllüev; **Critical Review:** Kayhan Öztürk, Ersen Koç; **Materials:** Nurdoğan Ata, Kayhan Öztürk.

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