Case Report
Olgu Sunumu
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Risk of Oral Myiasis in Intensive Care Unit: A Case Report Caused by *Calliphoridae*

Yoğun Bakım Ünitesinde Oral Miyaz Riski: Calliphoridae Kaynaklı Bir Olgu Sunumu

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ABSTRACT

Myiasis is a rare ectoparasitic infestation characterized by the invasion of living tissue by fly larvae of the order Diptera. While larvae typically target wounded skin, ocular, nasopharyngeal, and gastrointestinal regions, oral myiasis is a less frequently reported but clinically significant site of infestation. Herein, we report a case of oral myiasis in a 68-year-old male patient who was intubated and managed in the intensive care unit following a high-altitude fall resulting in a Type III odontoid fracture. A tracheostomy was subsequently performed and during routine replacement of a nasogastric tube, multiple motile larvae were observed in the oral cavity. The larvae were mechanically removed, and the affected area was thoroughly irrigated with a sodium bicarbonate solution. Parasitological examination, including both macroscopic and microscopic analysis, identified the larvae as third-instar forms of the *Calliphoridae* family. Despite ongoing intensive supportive care, the patient developed sepsis and multiorgan failure, culminating in cardiopulmonary arrest and death. This case suggests that oral myiasis may occur even under strict adherence to standard infection control measures. It highlights the necessity for individualized risk assessment and the implementation of advanced, targeted prevention strategies in vulnerable intensive care unit populations, considering the complex interplay of host, environmental, and systemic factors.

Keywords: Oral myiasis, intensive care, *Calliphoridae*, parasitic infestation

ÖZ

Miyaz, Diptera takımına ait sinek larvalarının canlı dokuya invazyonu ile karakterize nadir bir ektoparaziter enfestasyondur. Larvalar genellikle yaralı deri, oküler, nazofarengeal ve gastrointestinal bölgeleri hedef alırken, oral miyaz daha az sıklıkla bildirilen ancak klinik açıdan önemli bir tutulum bölgesidir. Bu olgu sunumunda, yüksekten düşme sonrası entübe edilerek yoğun bakımda takip edilen ve Tip III odontoid fraktürü nedeniyle trakeostomize edilen 68 yaşındaki bir erkek hastada gelişen oral miyaz tablosu sunulmuştur. Nazogastrik sonda değişimi sırasında oral kavitede çok sayıda hareketli larva tespit edilmiş, fiziksel olarak uzaklaştırılan larvaların bulunduğu bölge sodyum bikarbonat ile irrigasyon yoluyla temizlenmiştir. Parazitolojik incelemeler, larvaların *Calliphoridae* ailesine ait üçüncü dönem larvalar olduğunu doğrulamıştır. Hastada, takip sürecinde sepsis ve çoklu organ yetmezliği gelişmiş; tüm yoğun girişimlere rağmen kardiyopulmoner arrest sonrası eksitus gerçekleşmiştir. Bu olgu, standart enfeksiyon kontrol önlemlerine tam olarak uyulmasına rağmen miyazın, konak faktörleri ve çevresel koşulların etkileşimiyle gelişebileceğini ortaya koymakta; yoğun bakım hastalarında bireyselleştirilmiş risk analizi ve gelişmiş önleme stratejilerinin önemini vurgulamaktadır.

Anahtar Kelimeler: Oral miyaz, yoğun bakım, *Calliphoridae*, paraziter enfestasyon

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INTRODUCTION

Myiasis, derived from the Latin words "*myia*" (fly) and "*iasis*" (disease), refers to a rare ectoparasitic infestation characterized by the invasion and development of fly larvae from the order Diptera within the tissues of humans or animals (1). Clinically, it results from the colonization of viable or necrotic tissue by larvae and can lead to significant complications if not diagnosed and treated promptly. The clinical manifestations vary depending on the anatomical site of infestation, the species of the larvae, and the immunological status of the host (2). Although more frequently reported in tropical and subtropical regions, isolated cases of myiasis have been documented in other geographical areas when favorable environmental conditions are present. Warm and humid climates promote increased fly activity, facilitating oviposition or larval deposition onto open wounds, mucosal surfaces, or natural body orifices of susceptible hosts (3). Predisposing factors include poor hygiene, low socioeconomic status, advanced age, chronic illnesses, immunosuppression, substance use, prolonged immobilization, and long-term intubation (4).

Myiasis is classified anatomically as wound, furuncular, cavitary, or hematophagous types, and ecologically as obligatory, facultative (primary, secondary, tertiary), or accidental (1,3). Globally, 37 fly species from 10 different families within the Diptera order have been implicated in human myiasis, with species from the *Calliphoridae* (12 species) and *Sarcophagidae* (9 species) families being the most common. While oral myiasis has been reported in the literature, it remains a relatively infrequent manifestation compared to cutaneous, ocular, nasopharyngeal, and gastrointestinal forms (4). It typically occurs in individuals with poor oral hygiene, necrotic periodontal tissues, immunosuppressive states, or reduced consciousness (5). The larvae thrive in moist, oxygen-poor environments; periodontal pockets provide an ideal habitat for larval development. Their photophobic behavior further encourages deeper tissue migration as they progress to the pupal stage (6).

In this report, we present a case of oral myiasis in a patient who developed the condition following prolonged intubation due to trauma-induced loss of consciousness. The aim of this study is to discuss the diagnostic approach, clinical management, and therapeutic interventions in the context of current literature, while emphasizing the clinical relevance of this uncommon but potentially serious infestation.

CASE REPORT

A 68-year-old male patient was admitted to the Anesthesiology Intensive Care Unit of Manisa Celal Bayar University Hafsa Sultan Hospital following a high-altitude fall, resulting in severe cervical trauma, impaired consciousness, and acute respiratory failure. He was intubated upon arrival and underwent cervical computed tomography, which revealed a Type III odontoid fracture at the C2 vertebra. Tracheostomy was performed early during mechanical ventilation, and multidisciplinary critical care management was initiated. During the intensive care unit stay, the patient received invasive mechanical ventilation and enteral nutrition via a nasogastric tube. Nursing care, oral hygiene, and antimicrobial therapy were administered according to current evidence-based protocols. On day 12 of hospitalization, larvae were observed in the oral cavity during routine nasogastric tube replacement. Detailed clinical examination confirmed that the infestation was confined to the oral mucosa, with no evidence of larval presence around the tracheostomy site or within the trachea. Mechanical debridement was performed, followed by irrigation of the affected area with a sodium bicarbonate solution. The removed larvae were preserved in 70% ethanol and referred to the parasitology laboratory for identification. Specimens measuring 7-8 mm with typical segmental morphology were observed during macroscopic evaluation. Stereomicroscopy and light microscopy demonstrated 12 segmented bodies, prominent paired oral hooks, well-developed oral sclerite structures, and complete peritreme closure with distinct button and slit formations on posterior spiracles. Based on morphological features and taxonomic analysis, the larvae were conclusively identified as third instar (L3) *Calliphoridae* species belonging to the order Diptera (Figure 1). Despite supportive measures, the patient developed progressive cardiovascular and respiratory failure and did not respond to cardiopulmonary resuscitation, resulting in death five days later.

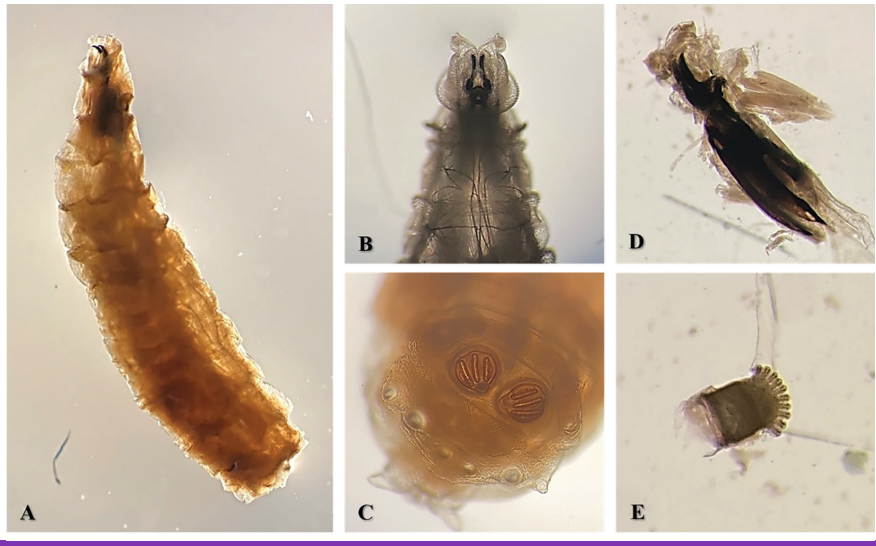

Figure 1. Microscopic characterization of a third-instar larva belonging to the *Calliphoridae* family. A: Total view of the 3rd stage larvae (4x), B: Anterior end demonstrating the cephalopharyngeal skeleton and anterior spiracle (40x), C: Posterior end showing a trifurcated posterior spiracle (40x), D: Cephalopharyngeal skeleton (40x), E: Anterior spiracle (40x)

Since the patient was lost when myiasis was identified, the patient's approval could not be obtained.

DISCUSSION

Oral myiasis is an uncommon form of parasitic infestation, defined by the colonization and development of dipteran larvae within the oral cavity. Although documented in the literature, it occurs less frequently than cutaneous, ocular, or other anatomical variants (7,8). The oral environment typically serves as a natural barrier to larval development due to continuous mechanical cleansing, salivary flow, and antimicrobial components. However, factors such as immunosuppression, prolonged intubation, poor oral hygiene, necrotic tissue, and loss of consciousness can compromise these defenses and create a favorable environment for infestation (9). Clinically described for the first time in 1909, oral myiasis may present with symptoms such as oral pain, swelling, fetid odor, and a sensation of larval movement (10). In intensive care patients, the inability to maintain oral hygiene and the presence of necrotic tissue increase the risk of fly oviposition. Under suitable temperature and humidity conditions, deposited eggs hatch rapidly, and the emerging larvae invade the oral mucosa. Once penetrated into the tissue, larvae orient their posterior spiracles toward the surface for respiration while embedding their anterior segments into deeper tissues. This configuration allows them to be protected from environmental factors and continue their development. Through this invasive process, larvae typically reach the prepupal stage within 8 to 12 days (11). During their development in human tissue, larvae progress through three instar stages (L1 to L3), each characterized by distinct morphological features. Although myiasis more commonly involves anatomical sites such as the nasal cavity, eyes, ears, and lungs, oral involvement remains relatively uncommon. This infrequency is likely attributable to the oral cavity's limited exposure to external environmental factors and its effective local defense mechanisms. Nevertheless, when these barriers are compromised, the oral cavity may become a potential reservoir for larval development (12).

Reported cases of oral myiasis worldwide vary depending on the geographic distribution of the causative fly species, environmental conditions, and individual risk factors. Species such as *Oestrus ovis* (13), *Musca domestica* (14), *Chrysomya bezziana* (15) and *Lucilia sericata* (16) have been isolated in different regions and are associated with host-specific conditions including poor oral hygiene, history of trauma, immobility, and intensive care hospitalization. Similarly, cases reported from Türkiye indicate that oral myiasis is often linked to predisposing factors such as prolonged intubation, inadequate oral hygiene, and immunosuppression. In this context, *Lucilia sericata* (17), *Sarcophaga* spp. (18), *Wohlfahrtia magnifica* (19), *Hypoderma bovis* (20) and larvae from the *Calliphoridae* family (21,22) have been isolated in various clinical scenarios, including intubated patients, individuals with impaired consciousness, and residents of rural areas. These findings clearly demonstrate that the development of oral myiasis is influenced not only by the presence of specific vector species but also by the host's general health status, immune condition, and living environment.

In our case, the patient's prolonged immobility due to impaired consciousness in a rural setting, along with direct exposure to environmental factors, created a favorable condition for flies of the *Calliphoridae* family to deposit eggs within the oral cavity. The persistently open mouth position reduced salivary secretion, and consequent deterioration in oral hygiene provided a microenvironment conducive to larval colonization. This scenario significantly increases the risk of infestation, particularly in elderly, immunosuppressed, or unconscious individuals. The submucosal localization of the larvae within the oral mucosa may lead to the absence of typical symptoms in the early stages of infestation, potentially delaying diagnosis. Unlike superficial involvement, larval invasion into deeper tissues complicates the identification of pathognomonic signs during routine oral examinations, often resulting in a diagnosis at more advanced stages. Similarly, the literature indicates that larvae in the L1 and L2 stages tend to progress asymptomatically, with clinical manifestations usually emerging upon transition to the L3 stage (10). These findings suggest that relying solely on clinical symptoms may be insufficient for diagnosing oral myiasis. A comprehensive assessment that includes a detailed patient history, environmental exposure, and understanding of larval developmental stages is essential for timely and accurate diagnosis.

CONCLUSION

In conclusion, the occurrence of oral myiasis in the present case, despite strict adherence to standard infection control measures within an intensive care unit, suggests that such infestations cannot be entirely prevented through systemic measures alone. Impaired consciousness, prolonged mouth opening, and compromised mucosal barrier integrity, combined with exposure to environmental vectors, created favorable conditions for infestation. This underscores the need for individualized and proactive surveillance strategies in high-risk patients, supplementing existing clinical protocols. Structured follow-up systems, including regular oral examinations and targeted larval screening, may facilitate earlier diagnosis and improve treatment outcomes. Moreover, documenting such infrequent yet clinically significant cases is crucial for raising awareness and guiding both diagnostic and preventive approaches in comparable clinical contexts.

* Ethics

Informed Consent: Since the patient was lost when myiasis was identified, the patient's approval could not be obtained.

Footnotes

This study was presented as an electronic poster at the 40th International Turkish Microbiology Congress, held on November 16-20, 2022, in Antalya, Türkiye.

*Authorship Contributions

Surgical and Medical Practices: A.Z.A., Ö.H., D.T.A., Concept: A.Y., T.A., D.T.A., Ü.Z.O., Design: A.Y., T.A., D.T.A., Ü.Z.O., Data Collection or Processing: A.Y., T.A., A.Z.A., Ö.H., Analysis or Interpretation: D.T.A., Ü.Z.O., Literature Search: A.Y., T.A., Writing: A.Y., T.A., D.T.A., Ü.Z.O.

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