

Case Report

Asian Pacific Journal of Tropical Medicine

apjtm.org

doi: 10.4103/apjtm.apjtm_288_25

Furuncular myiasis caused by *Wohlfahrtia magnifica* in a healthy child: A case report

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ABSTRACT

Rationale: Myiasis is more commonly found in ulcerated tissues and tropical climates, although it can also occur in non-tropical climates and in healthy individuals.

Patient concerns: The patient was a 4-year-old girl who presented to the emergency department with three nodular lesions on the skull, associated with edema, tenderness, pain, and purulent drainage.

Diagnosis: Furuncular myiasis caused by *Wohlfahrtia magnifica*.

Interventions: Antibiotic therapy was initiated, and the patient was taken to the operating room for larval removal. Mupirocin ointment and petroleum jelly were applied daily. Three days later, a second operation was performed to remove the remaining live larvae from the tissue.

Outcomes: After 14 days of treatment, the patient was cured and discharged.

Lessons: Although furuncular myiasis is more commonly observed in ulcerated and necrotic tissues, it can also occur in healthy individuals, particularly in the absence of proper hygiene, even in non-tropical regions.

KEYWORDS: Children; Furuncule; Myiasis; *Wohlfahrtia magnifica*; Turkey

1. Introduction

Myiasis is the infestation of human or animal tissues by the larvae of dipterous flies[1]. It is particularly prevalent in tropical and subtropical regions. The primary causative agents are species belonging to the families Oestridae, Calliphoridae, and Sarcophagidae[2]. Clinically, myiasis can be classified based on the affected organ or tissue, such as cutaneous, ophthalmic, intestinal, urogenital, nasopharyngeal, oral, and gingival forms. The invasion of the larva could be obligatory, facultative, or accidental[3,4]. There are three cutaneous forms of myiasis: wound, dermal, and furuncular.

Furuncular myiasis occurs when fly larvae invade the skin, leading to the formation of a lesion resembling a boil or abscess. Although particularly prevalent in tropical and subtropical regions, myiasis cases are not uncommon in Turkey[1]. Among the Sarcophagidae family, *Wohlfahrtia* (*W.*) *magnifica* is a significant species that frequently causes various forms of myiasis in Turkey[1,5].

W. magnifica is an obligate myiasis agent, and its larvae pupate in 4-8 days, then mature into adult flies in 5-15 days and can live for 1-3 months. Myiasis is more common in individuals involved in animal husbandry and is particularly prevalent during the summer months when the fly population increases. Furuncular myiasis typically does not develop on intact skin but is more commonly seen in neglected leg ulcers, various wounds, and tumors. It is extremely

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How to cite this article: Yahşi A, Orkun Ö, Kaya FD, Erten EE. Furuncular myiasis caused by *Wohlfahrtia magnifica* in a healthy child: A case report. Asian Pac J Trop Med 2025; 18(10): 471-474.

Article history: Received 21 May 2025 Revision 14 October 2025
Accepted 21 October 2025 Available online 31 October 2025

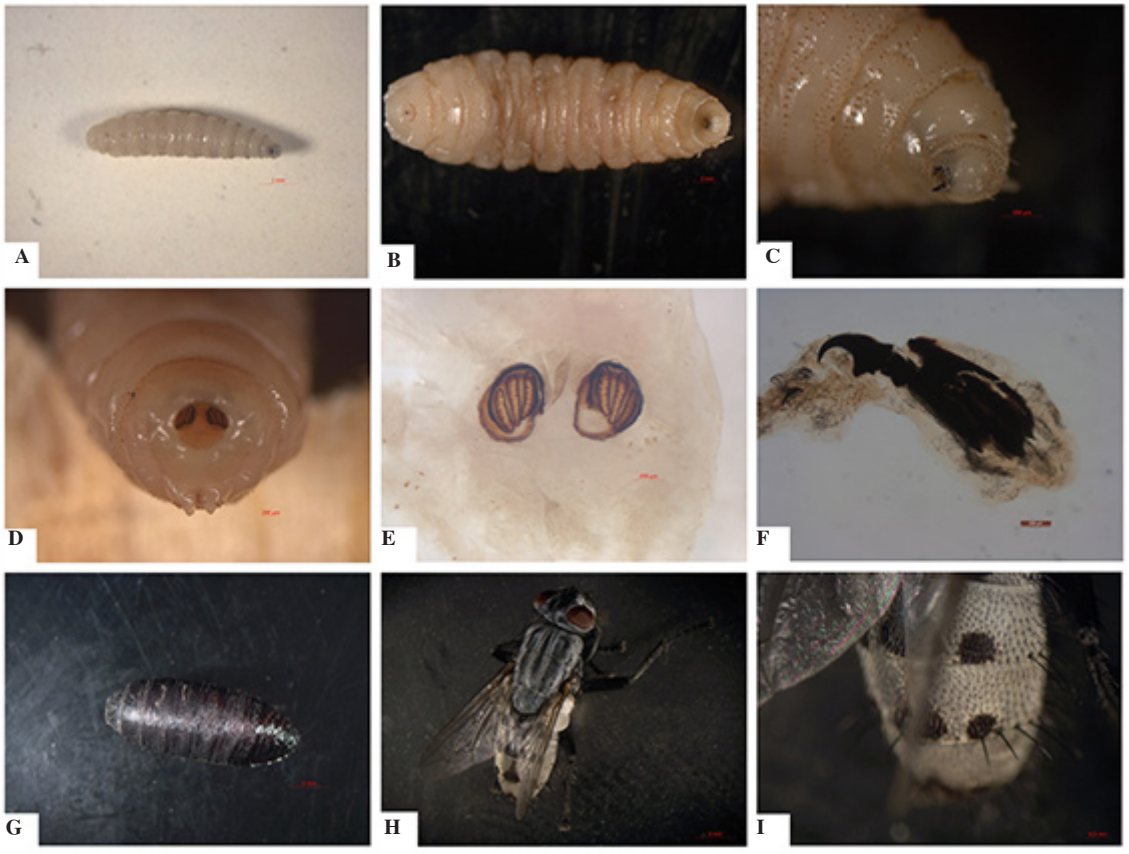

Figure 1. *Wohlfahrtia magnifica* in the scalp of a a 4-year-old girl with furuncular myiasis. Ventral morphological view of *Wohlfahrtia magnifica* L2 instar larva (A), L3 instar larva (B), clearly visible spines and the pair of oral teeth at the anterior end (C), posterior end showing the posterior spiracles with clear three peritremal slits (D, E), a clear cephalopharyngeal skeleton in the anterior end (F), pupal stage (G), and adult fly with distinctive patterns on the thorax and abdomen (H, I).

rare in continental climates. Studies of treating and following pediatric patients with myiasis are scarce in the literature[1,2,5,6]. In this article, we present a case of furuncular cutaneous myiasis caused by *W. magnifica* in a healthy child living in a continental climate.

2. Case presentation

In July 2023, a 4-year-old Turkish girl presented to the Emergency Department of Ankara Bilkent City Hospital in Turkey, with complaints of pain and itching in the scalp and head. The patient has had these complaints for the past twenty days. The emergency physician observed multiple painful, pruritic nodular lesions on the parietal and occipital regions of the scalp. In addition, pediculosis capitis was also present. After a haircut, three furuncles containing larvae became visible. Clinical examination revealed three well-circumscribed circular lesions in the parietal and occipital regions of the scalp, approximately 2 cm in diameter, with numerous larvae inside (Supplementary Figure 1). The patient's white blood cell count and eosinophil count were normal, and the C-reactive protein value was 53 mg/L (normal range: Less than 0.3 mg/dL). Initial surgical debridement was performed on the first day of hospital admission. Approximately 70 larvae were collected during the procedure, and 57 of them were sent to the Department of Parasitology, Protozoology, and Entomology, Ankara University for species identification. All affected areas were cleansed with alcohol and povidone-iodine. Local antibiotics (mupirocin ointment) and petroleum jelly were applied daily. Intravenous antibiotics (sulbactam-ampicillin) were started for a secondary bacterial infection and completed within 14 days. Three days post-surgery, the patient developed pain, a sensation of movement, and a burning sensation in the lower occipital region, approximately 3 cm below the initial surgical site. Physical examination revealed a newly formed 1 cm furuncle. During repeat

exploratory surgery, 3 larvae were removed through a new incision. At the end of the treatment, there were no complications after the surgical sites had healed, and the patient was discharged. The initial morphological examination of the larvae revealed that 35 larvae were in the third instar, while 22 larvae were in the second instar of larval development. In order to obtain adult flies, the most developed 12 third-instar larvae were incubated under suitable conditions (28 ℃ and 90% humidity). Larval identification was performed on mature third-instar larvae. Based on the morphological features described previously, the examined larvae, pupal stage and adult flies were identified as *W. magnifica*, as shown in Figure 1. There were no recurrences or complications observed during the twelve-month follow-up period after the patient was discharged.

3. Discussion

Myiasis is more common in the tropical and subtropical regions, where the warm and humid climate provides optimal conditions for fly reproduction. The pathogens responsible for myiasis vary between countries and continents. *Dermatobia hominis* is endemic to the Americas, while *Cordylobia anthropophaga* and *Cordylobia rhodaini* are endemic to Africa[1]. *W. magnifica* is frequently found in wound myiasis seen in the Mediterranean basin, South Russia, Turkey, Israel, and the Middle and Far East regions[6]. Identification of larvae is important both in determining the possible causative agent diversity of countries and in accumulating entomological knowledge. *W. magnifica*, the causative agent of myiasis in the patient, has been detected in our country and case reports in children are rare[7].

In order to estimate the possible causative agent in patients, it is important to question their recent past locations and living conditions. Prior to relocating to Ankara, the patient lived in Şanlıurfa, a city in eastern Anatolia characterized by a warm and terrestrial climate. The people around the barn and stables as well as in the grassland are at risk of myiasis because sheep and cattle breeding is done intensively in the region. The patient's family's involvement in animal husbandry and living in a rural area constitute risk factors for myiasis. Myiasis is not often seen in healthy people, such as the patient in this case. It is commonly seen in patients with mental retardation or psychiatric disorders, elderly individuals, those with poor self-care and hygiene, and those with immune system disorders[7]. It is classified as a neglected disease, with primary contributing factors including low socioeconomic conditions and delays in seeking medical care. Furuncular myiasis is rarely observed on intact skin, but is more commonly found in neglected leg ulcers, various wounds, and tumors. In children and adolescents, the main factors associated with larval infestation are the presence of other infectious and allergic conditions, particularly pediculosis. The patient presented with a combination of pediculosis and myiasis, similar to findings from a study on children with myiasis conducted in Brazil[6]. Disruption of the skin's integrity due to pruritus likely facilitated the development of myiasis.

Clinical findings depend on the type of fly, its number, and the location of the infestation. In a literature review of pediatric myiasis cases, it was observed that myiasis lesions commonly manifest on the scalp in children and on the lower extremities in adults[6]. The patient presented with similar lesions on the scalp. Factors such as lack of protective clothing in exposed areas, increased susceptibility to infestation following trauma or pediculosis, delayed diagnosis due to presence of long hair, and challenges in expressing symptoms such as sensation of movement, burning, and itching resulting from larval migration in children, may have contributed to this outcome.

Myiasis can cause severe consequences such as reactions due to inflammation and secondary bacterial infections, extensive tissue damage such as deep ulceration, and intracranial invasion. Treatment of cutaneous myiasis involves the removal of larvae and the application of petroleum jelly or other oily substances to suffocate them[8]. In this case, after the larvae were surgically removed, petroleum jelly and mupirocin were applied locally on a daily basis. Three larvae, which may have been deeper and not visible during the initial exploration, became superficial and symptomatic after three days due to hypoxia. These larvae were subsequently removed during a second surgical exploration. Secondary bacterial infections may arise due to wound contamination or incomplete removal of the larvae during extraction. Therefore, antibiotic therapy may be necessary in patients similar to the one in this case.

Myiasis is a public health concern influenced by various factors, such as inadequate hygiene and sanitation practices, as well as low socio-cultural standards[5,9]. It can affect individuals with underlying medical conditions in tropical and subtropical regions, as well as healthy children residing in continental climates. Conducting a comprehensive physical examination, initiating timely and effective treatment, and identifying the underlying cause to establish epidemiological data are crucial steps in managing myiasis.

Conflict of interest statement

The authors declare that they have no conflict of interest.

Patients' consent to participate

In accordance with our hospital's case report publication policy, ethics committee approval was not obtained. Written informed consent has been obtained from the patient's guardian for the publication of this case report and its accompanying images.

Funding

The authors received no extramural funding for the study.

Authors' contributions

AY developed the theoretical formalism and writing. Both OO and FDK were involved in the identification of the parasite. EEE performed surgical intervention on the patient. All authors contributed to the final version of the manuscript. AY supervised the project.

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Edited by Pan Y, Lei Y, Zhang Q



Supplementary Figure 1. Furuncular, scalp lesion containing larvae of *Wohlfahrtia magnifica.*