

Clinical observation of furuncle myiasis: diagnosis and treatment

© Y.G. KHALIULIN, E.A. PECHATNIKOVA, V.C. AKIMOV, D.N. SEROV

European Medical Center, Moscow, Russia

ABSTRACT

Tropical dermatoses are rarely found in the practice of a dermatologist in Russia. Given that sometimes residents of Russia travel to tropical countries on vacation or on business trip, it is important to know what diseases are endemic for these areas. We present the clinical observation of furuncle myiasis in a patient who visited Brazil shortly before the disease. The disease manifested itself in the form of growing painful abscesses of the scalp skin, the diagnosis caused difficulties. A dermatologist, therapist, neurologist, and surgeon participated in the diagnosis and treatment of the disease. Some of the proposed treatments mitigated the symptoms of disease a little, while others were ineffective. The disease gradually developed, despite the use of various drugs. Only after surgery was it possible to identify the cause of painful scalp infiltrates. The article explains the epidemiology and pathogenesis of furuncle myiasis, various methods for its diagnosis and treatment. Some of the methods of diagnosis and treatment are not sufficiently developed or are not acceptable for medical care in Russia. The possibility of furuncle myiasis in patients with painful infiltrates in open areas of the body who have a history of visiting South and Central America should be suggested.

Keywords: *myiasis, tropical dermatoses, diagnosis, treatment.*

Khaliulin Y.G. — <https://orcid.org/0000-0001-6744-486X>

Pechatnikova E.A. — <https://orcid.org/0000-0002-0074-7994>

Akimov V.C. — <https://orcid.org/0000-0002-5044-422X>

Serov D.N. — <https://orcid.org/0000-0001-7760-1363>

Corresponding author: Khaliulin Y.G. — e-mail: ykhaliulin@emcmos.ru

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Introduction

Miasis — infestation of tissues of living people and vertebrates by membrane insect larvae, widespread in all tropical regions of the world. The disease is usually observed in domestic and wild animals, in humans it is rare [1].

Epidemiology and classification

In countries that are not endemic to myiasis, the disease is the fourth most common skin condition associated with travel [2]. The incidence of myiasis in humans may correlate with increased populations of flies, poor hygiene and the presence of pets in close proximity. Other factors responsible for miazas include neglect of open wound treatment and the strong smell of open body surface [1]. Myiasis is predisposed to miazas, mental retardation, cerebral palsy, epilepsy, and alcoholism [2].

Higher air temperatures accelerate the development of flies and eventually increase their number. It can also be assumed that extreme weather events, such as prolonged heat periods, can affect the behaviour of flies that cause miazas. For example, wounds or exogenous objects introduced into the human body may become more attractive to insects [3].

According to ICD-10, a distinction is made between skin miazas (B87.0), which include the boil and migratory

miazas, wound miazas (B87.1), eye miazas (B87.2), nasopharyngeal miazas, including laryngeal miazas (B87.3), ear miazas (B87.4), other miazas (B87.8), i.e., gastrointestinal and genitourinary miazas, and indeterminate miazas (B87.9).

The most common form of miazas in travelers returning from other countries is localized furuncle miazas (FM), which, according to literature, accounts for 2.7 to 10% of all dermatoses in this group of people [4].

A series of cases of myiasis brought to western countries are described. However, these series are relatively small, and therefore it is not possible to compare clinical course and risk factors between different pathogens [4]. In Russia only single cases of FM in humans have been described [5–7].

FM occurs due to bites of mosquitoes and other blood-sucking insects that carry the eggs of flies. It is localized in open areas such as the scalp, face, forearms, shins. Foci can be painful, itchy and dense, and patients often get the feeling that something is moving under the skin. Patients sometimes also complain of increased body temperature and increased lymph nodes (in multiple lesions). The main causative agent for FM is the larvae of the *Dermatobius hominis* fly, which lives in tropical countries of Central and South America. Females of these flies attach their eggs with adhesive to the bodies of mos-

quitoes biting *Stomoxys calcitrans*, which are also called "autumn lighter", or to ticks. In North America, the frequent pathogens for FM are *Hypoderma lineatum*, *Cuterebra cuniculi* rabbit cuniculi and *Wohlfahrtia vigil*, a gray meat fly. *Wohlfahrtia vigil* may pierce the skin of an infant, but not of an adult. The larvae of *Cochliomya hominivorax* meat flies living in America cause FM in the head and neck area. Eggs penetrate the skin after insect bites. After a few days, a painful boil develops, where the fly larvae is located [8]. In Africa, the main pathogen is *Cordylobia anthropophaga* (Tumbu fly). The genus *Cordylobia* also contains 2 less common species: *Cordylobia rwan-dae* and *Cordylobia rodhaini* (Lunda fly). Usually hosts *C. rodhaini* are different mammals (especially rodents) and humans are infected by accident [4].

Unwanted colonization of fly larvae may not only affect soft tissue in humans, but may also cause associated infections or psychosocial problems [3].

Differential diagnostics

The FM should be differentiated from the following diseases: furuncle; insect bite with lymphoplasia; epidermoid cyst, follicular or pilar cyst (sebaceous cyst or atheromic cyst); oncocerciasis; tun religion; abscess; migratory skin larvae; nodular scabies; loaosis; foreign body; shingles, initial manifestations; B-lymphoma; leishmaniasis of skin.

Clinical observation

The patient, 44, went to the general practitioner to complain about a lump in the neck area. She noticed a neck swelling on the day of the consultation, a week after returning from Brazil. Shortly before this, there had been a small mass on the scalp. The general health did not suffer. Body temperature was not rising. The examination revealed an increase in the submandibular, posterior and anterior cervical lymph nodes, which were also verified by ultrasound. The overall blood count was within normal limits.

Infectious mononucleosis or lymphoproliferative disease is suspected. The examination plan, in addition to a general blood test, included a study of antibodies to the Epstein-Barr virus, chest X-rays. A dermatologist's consultation was recommended. During examination: the pathological process is localized on the skin of the occipital region. It is represented by 5 hemispherical and conical papules of rounded outlines, dense consistency, stagnant red with a cyanide tint, diameter from 0.2 to 0.3 cm. The papules are follicular, on the surface of most pustule papules with the content of yellow and white color, the hair shaft comes out of the center of the pustule. Pyodermia of the scalp is presumed. Outwardly recommended cream with fusic acid and beta-methasone valerate. The treatment with this cream was ineffective.

The patient was examined by an infectious disease doctor. A microbial skin infection is suspected. When collecting anamnesis patient denies bathing in open water, contacts with animals, birds, raw materials of animal origin, animal products. Possible, in the patient's opinion, mosquito bites.

Seeding one of the nodes to be separated, however, did not reveal any pathogenic microflora. We assumed a false positive sowing result. Antibacterial therapy was recommended. Meanwhile, inflammatory nodes on the scalp gradually increased in size, became painful and interfered with sleep. Episodes of stabbing pain in the left occipital area lasting for several seconds, several times a day, were disturbing.

Patient went to the dermatologist again. Based on the clinical picture (itchy and painful infiltrates on one side of the scalp, lymphadenopathy), a herpes zoster on the scalp without lesions of cranial nerves is assumed. An externally 1% solution of clindamycin is prescribed 3 times a day, 7 days, inside a tablet of valacyclovir 1000 mg 3 times a day.

DNA detection of the herpes zoster virus from foci and serological diagnostics have been added to the examination. Antibodies to the herpes zoster virus (IgG) were high (1564 mE/ml, positive over 165 mE/ml), serum IgM antibodies and PCR from focal areas on the scalp were negative. A high positive titre of antibodies to herpes zoster is considered evidence of recent infection. However, negative PCR and IgM results call into question the diagnosis of herpes zoster, as a persistent high IgG titer is also possible after varicella.

Antibodies to leishmaniasis, Epstein-Barr virus were negative in the blood.

The patient has been examined by a neurologist. She was diagnosed with occipital nerve neuralgia on the left. Carbamazepine was recommended, which was later canceled due to side effects.

Later on, when examining the skin infiltrates of the scalp, a pus detachable under pressure was detected. The patient is referred to a surgeon to open the pustules. Only then, almost a month after the initial treatment, revealed the cause of lymphadenopathy and painful scalp infiltrates. After the skin incision, an insect larvae appeared in the gap of the wound. All the infiltrates were opened and each of them contained fly larvae (**see figure**). The larvae were sent to the laboratory of the E.I. Martsinovskiy Institute of Medical Parasitology, Tropical and Vector-borne Diseases and were identified as *Dermatobia hominis* fly larvae.

Discussion

Diagnostic and treatment possibilities of FM

In our case, the patient did not have any predisposing socioeconomic or medical factors mentioned above, except staying in the endemic zone for myiasis. Never-



Dermatobias hominis larvae after surgical removal.

theless, this led to the development of multiple foci of larval parasitization, whereas usually the traveler develops only one foci [4]. Diagnosis of FM took a long time due to the rarity of pathology in Russia and because the clinical picture resembles other, more common diseases. It should be noted that we are not alone in the late diagnosis of FM. For example, colleagues from Italy described the case of FM, which they diagnosed after 2 months of observation and ineffective treatment [9]. Painful scalp infiltration accompanied by lymphadenopathy may be the initial manifestation of herpes zoster with lesions of cranial nerves when the typical clinical picture

with grouped vesicles on the skin has not yet appeared. Painful nodes with purulent detachment and lymphadenopathy logically suggest abscesses caused by golden staphylococcus. Given that Brazil is an endemic area for leishmaniasis of the Old World, skin leishmaniasis should also be excluded. A multichannel colour Doppler ultrasound device with variable and high-frequency sensors (upper range 15–22 MHz), which allows to observe skin layers and deeper structures with high resolution, can help to diagnose myiasis [10]. The authors from Italy believe that dermatoscopy can help in FM diagnosis. Dermatoscopic signs of FM are creamy yellowish background, blood vessels, black dots, the symptom of "avian paws" and the symptom of "crown of thorns" [11].

The treatment is to remove the larvae. This can be done surgically or by squeezing after the occlusion of the bite site. The larva requires oxygen to develop under the skin. Introduction of anesthetic into the lesion area, occlusion with hair gel, surgical lubricants, pork fat or bacon will cause the larva to move upwards, which facilitates its removal [8]. The method of extruding the larvae after termination of air access is suitable only for mature larvae and requires its complete removal, excluding its rupture, because rupture of the larvae in the wound leads to severe pain and sharp increase of inflammation [12]. A possible method of FM treatment is cream with ivermectin [13, 14].

Conclusions

It should always be kept in mind the possibility of FM development in patients with painful infiltrates in the open areas of the body, who have anamnesis of visiting South and Central America.

The authors declare no conflict of interest.

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