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Cutaneous furuncle-like lesions with an unexpected diagnosis: a case report

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ABSTRACT

Introduction: Myiasis, the infection by a fly larva, usually occurs in tropical and subtropical areas. In non-endemic countries, cutaneous myiasis might become an important condition as the returning traveller might import this infection, expanding the agents' transmission. Furuncular myiasis mimics common dermatoses, which might lead to misdiagnoses and inadequate treatment. Our purpose is to characterise lesions' features, helping diagnose, treat and emphasize the relevance of an adequate anamnesis.

Case description: A 40-year-old man with an unremarkable medical history, unknown allergies, no medication, and updated vaccination schedule, came upon our primary-health-care unit complaining of three erythematous skin lesions, moderately painful, noticed eight days before. Other symptoms, bites, or similar lesions in the household were denied. While exploring recent travels, the patient reported he had been to São Tomé e Príncipe. On physical examination, three furuncle-like lesions with a central pore were observed. While awaiting travel/tropical medicine advice, an oral antibiotic was prescribed. Hours later, the patient was advised to avoid lesions' expression and occlude central puncta with petroleum, forcing the organism to emerge and be grasped. The day after, the patient reported larvae extrusion from each lesion. Only skin hyperpigmentation was left after a month.

Comment: Furuncular myiasis occurs as a furuncle-like lesion with a central punctum, being the maggot evidenced by visualization of its posterior part. Movement sensations, pruritus, and pain appearing at night are frequently reported. Complete larvae removal and prevention and control of secondary infection are treatment goals. Considering furuncular myiasis among differential diagnoses reduces the unnecessary use of antibiotics and its consequences on resistance. Furthermore, in primary care, there is an optimal opportunity to offer travellers preventive care and health education. Thus, exploring exposures with a detailed clinical history might prevent myiasis-causing flies to become established in non-endemic regions.

Keywords: Myiasis; Furuncular myiases; Case report.

INTRODUCTION

Increasing international travel may raise health risks based on the travellers' and the destinies' particular characteristics. Traveling to different environments might expose the individuals to new diseases, climates, and altitudes.[1] The majority of travellers do not report health problems during the journey and are asymptomatic on return. However, annually, around 8% of travellers will search for medical advice.[2]

Myiasis is the infestation of live vertebrate hosts by a fly with dipterous larvae, usually occurring in tropical and subtropical areas. In non-endemic countries, myiasis is also an important condition, as it can represent the fourth most common travel-associated skin disease.[3-4]

Cutaneous and wound myiasis is the most frequent clinical presentations.[3,5] Furuncular myiasis results from larvae penetration into healthy skin developing an erythematous furuncle-like nodule with a maggot inside it. Flies most commonly responsible for furuncular myiasis in humans include *Dermatobia hominis* (human bot fly – major cause in the Americas) and *Cordylobia anthropophaga* (tumbu fly – endemic in Afrotropical region).[5] The latter, lays its eggs on the ground or on damp clothes that are hung out to dry. The larvae hatch from the eggs and are activated by the host's body

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Figure 1. **(A)** Erythematous furuncle-like lesion with a central pore on the dorsum of left foot. **(B,C)** Erythematous plaques with a central pore on the right upper back (only one is shown).

heat or vibration, penetrating people's skin that contact with the ground or with drying clothes that have fly larvae attached to them.[3-5] The attack is often unnoticed by the host.[3]

Endemic in tropical areas it is uncommon in other locations, namely in Western countries, making its diagnosis difficult as myiasis mimics frequent cutaneous conditions, challenging an unsuspecting physician.

We aim to characterise the features of myiasis cutaneous lesions in order to accurately diagnose, select the appropriate treatment and emphasize the relevance of an adequate anamnesis.

CASE DESCRIPTION

A 40-year-old Caucasian male, married, living in a town on the north coast of Portugal, with optimal sanitary conditions. He has got a degree in physical education, works as an airline pilot, and belongs to a nuclear family in Duvall's family life cycle stage I and class II in Graffar's socioeconomic status scale. Unremarkable previous medical history, no medication, no drinking, smoking, or drug habits, unknown allergies, and an updated national vaccination schedule.

The patient calls upon our primary health care unit complaining of three skin lesions (one major on the left foot dorsum and two minors on the right upper back). An erythematous papule on the left foot was noticed eight days before the appointment. The lesion gradually enlarged and became more painful, mainly at night, with no detectable drainage. Fever or other constitutional symptoms were not reported. The patient could not recall any perceived bites and denied similar lesions in the household.

While assessing his recent travel history, the patient reported he had been in São Tomé e Príncipe for 14 days as a tourist, arriving in Portugal ten days before our medical appointment.

During physical examination three lesions were observed (A) – erythematous mass on the dorsum of the left foot with a central pore, with no fluctuance, cellulitis, exudate, or evidence of "movement beneath the skin" (B,C) – erythematous plaques with a central pore on the right upper back (Figure 1).

Oral amoxicillin + clavulanic acid 500 + 125mg and paracetamol 1000mg were prescribed and recommendations to monitor the body's temperature and watch for alarm signs were given, while waiting for travel and tropical medicine specialist advice.

On the same day, the patient was contacted and advise that given the history of travelling to São Tomé e

Figure 2. Larva emerging from the central pore after its occlusion with petroleum.

Figure 3. Larva, after its removal.

Príncipe, the diagnosis of myiasis was a hypothesis, and recommendations on how to deal with the lesions were addressed – avoid lesion expression and occlude the central punctum (breathing hole in the skin) with petroleum for at least 24 hours (Figure 2). This process forces the organism to emerge sufficiently to avoid asphyxia. Thereafter, it can be carefully grasped (with forceps or wooden spatula), reducing the risk of rupturing the maggot.

As the patient reported he felt slightly anxious with the latter process, reassurance was given and he was invited to return to clinical practice by the time larvae coming from the central punctum was apparent.

Roughly 24 hours after our first contact, the patient reported the extrusion of larvae from each lesion (Figure 3), which ended up occurring at the patient's home.

Three days after the first contact with the patient, his wife reported the appearance of the same type of lesions, that were treated following the same instructions.

A month later the lesions were completely healed with only some skin hyperpigmentation left.

COMMENT

In the Afrotropical region, four different species of Cordylobia (*C. athropophaga, C. rodhaini, C. ruandae,* and *C. ebadiana*) can be found. At least two of them are known as human myiasis agents.[6-7] Regarding *Cordylobia anthropophaga,* the risk of oviposition is higher for clothing left drying under a shade. In contrast, oviposition will not occur if clothes are dried under bright sunlight while ironing clothes destroy eggs and larvae. If penetration occurs through the host's skin, the larvae will continue development into the second and third instar, which is completed in eight to twelve days. At this stage, the mature larva exits the host to pupate outside. There is usually only one larva per lesion, but patients may have several lesions, which is consistent with our findings.[3,5]

Furuncular myiasis typically occurs as a furuncle-like lesion with a central punctum from which a watery, serosanguineous or purulent fluid can exude. The presence of the maggot is evidenced by direct visualization of the posterior part of the larva or bubbles in exudate. Patients frequently report movement sensations within the nodule, being larvae able to move on occasion.[3-5] Pruritus and paroxysmal episodes of lancinating pain (due to larvae activity and biting or secondary to chemical irritation to the larvae's formites) were also identified as the most frequent symptoms usually appearing suddenly at night.[4-5] In the case of the species mentioned above, the greater number of lesions commonly distributed across covered sites (such as the trunk, buttocks, and thighs) are found.[5] In the descri-

bed case, patient did not report symptoms other than moderate pain (five out of ten on the numeric pain rating scale), especially at night. However, the appearance and the distribution of the manifested cutaneous lesions were compatible with the descriptions found in the literature.

Most commonly, the lesion will completely heal, seldomly leaving hyperpigmentation or scarring at the site. Secondary bacterial infection is the principal complication.[5]

The differential diagnosis includes furuncle, insect bite, insect prurigo, inflamed cyst, and tungiasis, among others. As inflammation in the surrounding tissues may be intense, cutaneous myiasis might as well mimic pyoderma. Lack of response to antibiotic therapy should increase suspicion.[4-5]

Laboratory data are usually within the normal range, but peripheral eosinophilia, elevated levels of C--protein reactive and immunoglobulin E, may be found in a chronic infestation. Dermoscopy has been used to identify the posterior parts of the maggot and diagnosis may be confirmed through ultrasound or colour doppler sonography. Molecular diagnosis may be used to identify the larva species when expertise in tropical medicine is not available. On the other hand, biopsies should only be performed for academic purposes.[3-5]

The literature describes several treatment options for cutaneous myiasis. Complete removal of the larva and prevention and control of secondary infection is treatment goals. Three techniques may be used for larva removal: application of a toxic substance to the larvae and egg, surgical removal (usually unnecessary), and induction of localized hypoxia by occlusion of the central punctum.[4-5] However, there is the risk of organism asphyxiation without emerging. Dead larva may induce an inflammatory response, leading to a foreign--body granuloma.[4] To avoid this complication 1% lidocaine can be injected to paralyse the larva, easing its extraction.[4-5]

Oral treatment is not generally recommended as ivermectin may kill the larva inside the lesion leading to an inflammatory reaction. Antibiotics should only be prescribed in the presence of bacterial infections such as cellulitis or abscess formation.[4-5] As no signs of secondary infection were detected the patient was advised to stop the antibiotic previously prescribed.

After extraction, larvae should be killed in hot water or ethanol and preserved in 80% alcohol, for further entomological identification.[4] Unfortunately, we were not able to recover the organisms, as they were removed by the patient and we could not ensure that the samples met all the conservation standard conditions.

A number of cases of myiasis misdiagnosis have been reported worldwide, as early lesions resemble insect bites or furuncles until the larva grows and the typical pore appears. Furthermore, clinicians in non-endemic areas are mostly unaware of this disease, thus not considering its diagnosis in daily practice.

Awareness and understanding of the disease process are of particular importance to avoid delayed diagnosis and inadequate management such as incomplete larvae removal or inappropriate use of antibiotics and its consequences on resistance.

In the primary health care setting, we believe travellers' diseases tend to become more frequently seen which, to our knowledge, is an optimal opportunity to offer preventive care and contribute to patients' health education. In the case of myiasis, patients should be advised to be careful with the exposed skin (relevant for *Dermatobia hominis* species which bite exposed areas), limiting the area accessible to bites from flies, mosquitoes, and ticks. The use of insect repellent should follow guidelines and travellers should protect themselves with window screens, mosquito nets, and air conditioners where available. Ironing clothes that were put on the line to dry is another preventive strategy. As myiasis does not spread from person to person there are no concerns for the household.[3] However, as there is a probability of having been exposed to similar risk factors, the medical assessment should include the travel group.

Recent outbreaks of infectious diseases are in line with Thomas Friedman's (2005) belief that the 'world is flat', highlighting, in this context, the drawbacks of a globalized world when it comes to natural environment impact.[8] Therefore, with more persons travelling to (sub)tropical destinations, Family Medicine clinicians' training in travel medicine and cooperation with institutions such as institutes, clinics, and laboratories for tropical medicine should be improved.

Hence, it is essential to explore risk factors and possible exposures, namely recent travel, preventing

myiasis-causing flies to become established in non-endemic regions.

Patient's perspective

I originally sought medical advice because of the pain/discomfort that would not let me wear closed shoes. I had not thought of a cause-effect relationship between the travel to São Tomé e Príncipe days before and the appearance of the lesions. Before the diagnosis, I was considering the expression of the major lesion as I believed it could ease the discomfort. I was feeling slightly anxious with the process of waiting for larva extrusion, so I was satisfied with the given recommendations, reassurance, and availability of the medical staff.

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AUTHOR'S CONTRIBUTIONS

Conceptualization, JRS, and PV; methodology, JRS; writing—original draft preparation, JRS; review and editing, JRS, PV, CC, FS, and SL.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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RESUMO

LESÕES CUTÂNEAS FURUNCULOIDES COM UM DIAGNÓSTICO INESPERADO: RELATO DE CASO

Introdução: Miíase é a infeção causada por larva de mosca, ocorrendo nas regiões (sub)tropicais. Nos países não-endémicos torna-se relevante, dado que os viajantes que regressam podem importar infeções, expandindo a transmissão destes agentes. A miíase furuncular mimetiza dermatoses comuns, podendo originar tratamentos inadequados. Pretende-se caracterizar as lesões, auxiliar no diagnóstico e tratamento, enfatizando a importância de anamnese adequada.

Descrição do caso: Homem, 40 anos, sem antecedentes pessoais relevantes, medicação, alergias e com programa nacional de vacinação atualizado. Recorre ao centro de saúde por três lesões cutâneas, eritematosas, moderadamente dolorosas, desde há oito dias. Nega outros sintomas, picadas ou lesões semelhantes nos conviventes. Refere viagem recente a São Tomé e Príncipe. São observadas três lesões semelhantes a furúnculos com orifício central. Prescreveu-se antibiótico oral, aguardando-se recomendações por medicina do viajante e tropical. Horas depois contacta-se o utente, aconselhando-se a evicção da expressão das lesões e a oclusão dos orifícios centrais com vaselina, forçando a exteriorização da larva. No dia seguinte emergiram e foram removidas as larvas de cada lesão. Um mês depois, as lesões cicatrizaram deixando apenas hiperpigmentação cutânea.

Comentário: A miíase furuncular manifesta-se como lesão semelhante a furúnculo com orifício central, sendo a larva evidenciada através da visualização da extremidade posterior. Sensação de movimento, prurido e dor de aparecimento noturno são sintomas frequentemente reportados. A completa remoção das larvas e a prevenção e controlo de infeção secundária são os objetivos do tratamento. Considerar a miíase entre os diagnósticos diferenciais de lesões furunculoides reduz o uso injustificado de antibióticos e as resistências. Por outro lado, o contexto dos cuidados primários favorece uma oportunidade ótima à prestação de cuidados preventivos e educação para a saúde relativa ao viajante. Atender às exposições de risco e uma anamnese cuidada previne o estabelecimento da mosca responsável pela miíase em regiões não endémicas.

Palavras-chave: Miíase; Miíase furuncular; Relato de caso.