Cutaneous Myiasis: A Case Report of a 33-Year-Old Female Traveler in Conflict-Affected Sudan

Emmanuel Siddig[1], Mohamed Mahamud[2], Claude Muvunyi[3], and Ayman Ahmed[1]

[1]University of Khartoum
[2]SIMAD University
[3]Rwanda Biomedical Center

October 15, 2024

Brief report:

Cutaneous Myiasis: A Case Report of a 33-Year-Old Female Traveler in Conflict-Affected Sudan

Emmanuel Edwar Siddig [1 *], Mohamed Adam Mahamud[2], Claude M. Muvunyi[3], Ayman Ahmed [3,4]

1 Faculty of Medical Laboratory Sciences, University of Khartoum, Khartoum, Sudan.

2 Department of Microbiology and Laboratory Sciences, Faculty of Medicine and Health Sciences, SIMAD University, Mogadishu, Somalia

3 Rwanda Biomedical Centre, Kigali, Rwanda.

4 Institute of Endemic Diseases, University of Khartoum, Khartoum 11111, Sudan.

Correspondence: Emmanuel Edwar Siddig, University of Khartoum, Faculty of Medical laboratory Sciences, Khartoum, Sudan.

Tel: +249991398388

Email: emanwelleds389@gmail.com

Consent for Publication

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Acknowledgments

None.

Funding:

None

Disclosure

The author reports no conflicts of interest in this work.

Key clinical message:

This case underscores the importance of recognizing cutaneous myiasis in travelers, particularly in challenging settings such as conflict zones. Swift identification, prompt larvae extraction, meticulous wound care, and consistent antibiotic ointment application are crucial for successful treatment outcomes and preventing reinfestation. Healthcare providers should have a high index of suspicion for myiasis when encountering patients with insect bites that fail to heal, sharp stinging pain, discharge, redness, and visible punctures with clear discharge, especially in travelers returning from endemic regions.

Abstract:

Myiasis, a parasitic infestation caused by fly larvae, poses a significant health risk in tropical and subtropical regions, particularly amidst humanitarian crises. This case study reports a 33-year-old female traveler in Sudan who developed cutaneous myiasis following an insect bite on her left arm. Initial symptoms included persistent pain, discharge, and a visible puncture site. Comprehensive clinical examinations ruled out systemic conditions, confirming a diagnosis of myiasis. The treatment involved local anesthesia, larva extraction, and wound care, which was successfully managed over three weeks without recurrence. This case emphasizes the importance of recognizing myiasis, especially in settings marked by conflict where healthcare access and sanitation are compromised. Understanding the disease's presentation and timely intervention can mitigate the risks associated with myiasis and improve patient outcomes in affected regions. Enhanced public health measures, including community education and vector control, are vital in preventing the emergence of myiasis and related diseases in war-affected populations.

Keywords:

Cutaneous Myiasis; Parasitic infestation; Larvae extraction; Wound care; Sudan

1 Introduction:

Myiasis, a parasitic infestation caused by fly larvae consuming living or necrotic tissue, derives its name from the Greek word "Mya," meaning fly [1]. Originating from a suggestion by Hope, the term distinguishes diseases caused by dipterous larvae from those caused by insect larvae in general [2]. This condition is most commonly found in tropical and subtropical regions and occurs when flies deposit eggs on moist skin or in wounds [3]. Upon hatching, the larvae (maggots) secrete enzymes to digest the host's tissue [1,2,3].

Myiasis can affect both humans and animals, with different types of flies causing these infestations [1]. The disease presents in various forms based on the site of infection, such as sanguinivorous, dermal/subdermal, Nasopharyngeal, intestinal, and urogenital forms. The clinical features vary depending on the location of the infestation [1,4 - 8].

In cutaneous myiasis, characteristic boil-like lesions appear predominantly on exposed body areas like the scalp, face, forearms, and legs [9,10,11]. These lesions are often painful, itchy, and tender, with individuals experiencing a sensation of movement under the skin [9,10,11]. Swollen glands may also be present in some cases. Treatment typically involves removing the larvae and addressing any underlying issues to prevent recurrence [1,11].

2 Case history:

A 33-year-old female, traveling from Khartoum to River Nile State amidst the conflict in Sudan, discovered an insect bite on her left arm that failed to heal (Figure 1A). After a week, the lesion began to discharge, accompanied by sharp stinging pain at intervals and patient had a sensation of something moving inside the affected site.

3 Methods:

She had a normal pulse rate (74/min), respiratory rate (16/min), blood pressure (127/82), and temperature (37.5°C). Systemic examinations including cardiovascular (CVS), central nervous system (CNS), endocrine, and gastrointestinal (GIT) were all within the normal ranges.

Clinical examination of the affected area appeared reddened with one small puncture oozing a black streaked clear discharge. Nonetheless, no regional lymphadenopathy was detected. Examining the patient's liver functions showed serum bilirubin of 0.41 mg/dL, total protein of 7.9 g/d/L, serum albumin of 4.1 g/dL. Moreover, the tests revealed alkaline phosphatase of 91 U/L, aspartate aminotransferase (AST) of 21 U/L, and alanine aminotransferase (ALT) of 22 U/L. Testing renal functions of the patient, revealed normal blood urea of 29 mg/dL and serum creatinine of 0.33 mg/dL. Her random blood glucose was 128 mg/dl. Viral screening for human immunodeficiency virus (HIV), Hepatitis B and C were requested and all were negative.

4 Conclusion and result:

For diagnosis a local anesthesia with 2% lidocaine was administered, followed by a precise incision to explore the wound. Promptly, the larva was extracted (Figure 1B), and the wound thoroughly irrigated before being packed with iodoform gauze and dressed with bacitracin ointment. The patient received instructions to change the dressing daily, cleanse the wound, and reapply bacitracin ointment with each dressing change. Over a span of three weeks, the wound successfully healed without any recurrence of larvae infestation.

5 Discussion:

The case presented highlights a typical scenario of myiasis, a parasitic infestation caused by fly larvae, in a 33-year-old female traveler who was affected in a challenging setting due to the ongoing conflict in Sudan [12 - 16]. The clinical presentation included sharp stinging pain, discharge, redness, and a visible puncture with clear discharge, all indicative of a myiasis infestation [1, 11]. The absence of regional lymphadenopathy, combined with normal vital signs and systemic examinations, along with laboratory tests—including liver and renal function tests—provided a comprehensive picture of the patient's health status, effectively ruling out other systemic complications.

Myiasis can mimic other conditions such as cutaneous larva migrans, abscesses, cellulitis, spider bites, and pseudomonas infections, making proper identification crucial for effective treatment and complication prevention [1, 17, 18]. In this case, the patient's symptoms, travel history, and successful larva removal strongly supported a diagnosis of myiasis. While the lesion resembled a typical furuncle characterized by surrounding erythema and serosanguineous exudate, it presented two key distinctions. First, the level of pain was less pronounced than expected based on the surrounding erythema. Second, there was a small punctum evident at the center of the lesion, with some literature noting the occasional presence of a small white protruding body [1, 9 - 11]. Patients with myiasis often report pain, itching, or a crawling sensation [19 - 22]; however, our patient lacked severe pain despite the lesion's furuncle-like appearance. Lesions commonly manifest on exposed areas, including the head, face, back, abdomen, arms, and hands [1, 11].

The treatment approach, which included wound care, larva removal, and careful dressing changes, successfully facilitated the healing process without recurrence [1, 4 - 11]. The patient was closely monitored during follow-up visits, ensuring a complete recovery.

Myiasis poses significant risks to individuals living in areas affected by war and displacement. The ongoing conflict in Sudan has led to the breakdown of healthcare systems and worsened public sanitation, severely restricting access to clean water and proper hygiene facilities [12 - 17]. This environment fosters the spread of myiasis and other infectious diseases such as dengue, rift valley fever, malaria and mycetoma [23 - 33]. Additionally, the displacement of populations has resulted in overcrowded and unsanitary living conditions, making it easier for flies to deposit their eggs on open wounds or neglected skin, thereby increasing the risk of myiasis infections [34, 35]. The stress and malnutrition associated with war can further compromise immune systems, heightening susceptibility to various infections, including myiasis [35].

Addressing these underlying factors is crucial through adequate healthcare provision, sanitation measures, and ensuring access to essential resources to prevent the emergence and spread of such conditions in conflict-affected regions. The conflict has not only compromised public health infrastructure but has also contributed to an increase in myiasis and other infectious diseases. Comprehensive public health measures are now essential. Key initiatives should include community education about hygiene practices, timely medical

intervention for wounds, and enhanced access to healthcare resources. Moreover, establishing effective vector control strategies—such as promoting sanitation and waste management—can help reduce fly populations and, consequently, mitigate the risk of myiasis in affected regions.

In conclusion, while cutaneous myiasis is distressing, it can be effectively managed with appropriate interventions such as larva extraction, wound care, and infection prevention measures. The timely and comprehensive treatment in this case led to the resolution of the infestation, allowing for proper healing of the wound.

Consent for Publication

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Authors' contributions

AA, and EES conceived and designed the study; AA, and EES analyzed the data; AA, MAM, CMM, and EES wrote the manuscript. AA, MAM, CMM, and EES revised the manuscript. All authors read and approved the final manuscript.

Acknowledgments

None.

Funding:

None

Disclosure

The author reports no conflicts of interest in this work.

References:

1. Francesconi F, Lupi O. Myiasis. Clin Microbiol Rev. 2012 Jan;25(1):79-105.
2. Hope FW. On insects and their larvae occasionally found in the human body. Trans. R. Entomol. Soc. Lond. 1840: 256–271.
3. He Z, Wei X, Xu W, Wang X. A case report of female vaginal myiasis. Ann Med Surg (Lond). 2024 May 20;86(7):4206-4208.
4. Calderon-Lozano L, Giacaman A, Yagüe Torres F, Martin Santiago A. Diagnosis of Cutaneous Myiasis. Actas Dermosifiliogr. 2024 Jun 8:S0001-7310(24)00489-7.
5. Gil-Lianes J, Ivars M. Nodules in a Young Traveler: Utility of Dermoscopy in Cutaneous Myiasis. Actas Dermosifiliogr. 2024 Jun 7:S0001-7310(24)00485-X.
6. Behr W, Reimann K, Stuck BA. Aural Myiasis in a Two-Year Old Child. Dtsch Arztebl Int. 2024 May 31;121(11):372.
7. Khan HZ, Shahid SA, Bakht N, Zaidi SSN. Myiasis Encountered in Squamous Cell Carcinoma of the Oral Cavity: A Case Report. Cureus. 2024 Jun 15;16(6):e62414.
8. Wakid MH, Sharafeldein YS, Almakki AA, Alidrisi DA, Bashinim AA. Scrotal Myiasis in a Child Due to Cordylobia anthropophaga. Cureus. 2024 Apr 30;16(4):e59417.
9. Biernat B, Gładysz P, Sulima M, Sikorska K. Cutaneous myiasis caused by Dermatobia hominis (Diptera: Oestridae) in a Polish traveller to South America - a case report. Int Marit Health. 2024;75(1):61-63.
10. Joseph J. An unexpected skin infection: Furuncular myiasis in returning travellers. Aust J Gen Pract. 2024 Mar;53(3):141-143.
11. Jallow BJJ, Gassara G, Bajinka O, Luo Y, Liu M, Cai J, Huang J, Meng F. Human myiasis in Sub-Saharan Africa: A systematic review. PLoS Negl Trop Dis. 2024 Mar 28;18(3):e0012027.
12. Siddig EE, Eltigani HF, Ahmed A. Healing the unseen wounds: Sudan's humanitarian crisis traumatizing a nation. Asian J Psychiatr. 2023 Nov;89:103764.

13. Alfadul ESA, Alrawa SS, Eltigani HF, Ahmed A, Siddig EE. The unraveling of Sudan's health system: catastrophic consequences of ongoing conflict. Med Confl Surviv. 2023 Dec;39(4):364-368.
14. Siddig EE, Eltigani HF, Ali ET, Bongomin F, Ahmed A. Sustaining hope amid struggle: The plight of cancer patients in Sudan's ongoing war. J Cancer Policy. 2023 Dec;38:100444.
15. Siddig EE, Eltigani HF, Ahmed A. Urgent call to protect children and their health in Sudan. BMJ. 2023 Aug 9;382:1799.
16. El-Sadig SM, El-Amin SO, El-Amin RO, Siddig EE, Ahmed A. Humanitarian crisis in Sudan: the collapsed health system threats the public and global health. QJM. 2023 Oct 6;116(9):810.
17. Ahmed A, Hemaida MA, Hagelnur AA, Eltigani HF, Siddig EE. Sudden emergence and spread of cutaneous larva migrans in Sudan: A case series calls for urgent actions. IDCases. 2023 May 5;32:e01789.
18. Suryabanshi A, Timilsina B, Khadka N. Wound myiasis resulting from a neglected insect bite wound. Clin Case Rep. 2023 Jan 20;11(1):e6874.
19. Alvaro A, Casartelli M, Schiavini M, Fama F, Gabrieli P, Cordier L. A Case of Myiasis Caused by Cordylobia anthropophaga (Diptera: Calliphoridae) in an Italian Traveler Returning from Senegal. Acta Parasitol. 2024 Mar;69(1):1053-1057.
20. Egbuchulem KI, Ogundipe HD, Olulana DI, Ojediran TO. A RARE FINDING OF DISTAL PENILE FURUNCULAR MYIASIS IN A CHILD OF A NIGERIAN HEALTH CARE WORKER. Ann Ib Postgrad Med. 2023 Aug;21(2):103-105. PMID: 38298338; PMCID: PMC10811702.
21. Halani S, Chan A, Kilbertus S. A case of myiasis botfly infestation diagnosed through a virtual emergency department. CJEM. 2024 Mar;26(3):204-206.
22. Azarmi S, Akbarzadeh K, Ekrami A, Sheikh Z, Dehghan O. Scalp myiasis associated with soft tissue sarcoma lesion: a case report and review of relevant literature. BMC Infect Dis. 2024 Jan 5;24(1):51.
23. Siddig EE, Ahmed A. A diagnostic challenge of tongue botryomycosis miming mycetoma-A case report. Skin Health Dis. 2024 Aug 5;4(5):e433.
24. Ahmed A, El-Amin R, Musa AM, Elsayed MA, Fahal LA, Ahmed ES, Ali Y, Nebie IE, Mohamed NS, Zinsstag J, Siddig EE, El-Sadig SM. Guillain-Barre syndrome associated with COVID-19 infection: A case series. Clin Case Rep. 2023 Feb 24;11(2):e6988.
25. Ahmed A, Hagelnur AA, Eltigani HF, Siddig EE. Cutaneous tuberculosis of the foot clinically mimicking mycetoma: A case report. Clin Case Rep. 2023 May 4;11(5):e7295.
26. Siddig EE, Eltigani HF, Ahmed A. The Rise of AI: How Artificial Intelligence is Revolutionizing Infectious Disease Control. Ann Biomed Eng. 2023 Dec;51(12):2636-2637.
27. Ahmed A, El-Sadig SM, Siddig EE. Guillain-Barre syndrome associated with hepatitis E virus infection: A case report. Clin Case Rep. 2023 Aug 29;11(9):e7863.
28. Ali Y, Siddig EE, Mohamed N, Ahmed A. Rift Valley fever and malaria co-infection: A case report. Clin Case Rep. 2023 Sep 18;11(9):e7926.
29. Abdallah ATH, Abdelkhalig RE, Hamid E, Ahmed A, Siddig EE. Unusual manifestation of cystic mycetoma lesions: A case report. Clin Case Rep. 2023 Oct 17;11(10):e8054.
30. Ahmed A, El-Sadig SM, Eltigani HF, Bongomin F, Siddig EE. The first Helicobacter pylori-induced Guillain-Barré syndrome in Sudan. Clin Case Rep. 2023 Nov 14;11(11):e8204.
31. Abdallah ATH, Abdelkhalig RE, Hamid E, Ahmed A, Siddig EE. Recurrent abdominal wall mass in a hepatitis B-positive male: An unusual case of lumbar mycetoma. Clin Case Rep. 2023 Nov 30;11(12):e8275.
32. Siddig EE, Mohamed NS, Ahmed A. Severe coinfection of dengue and malaria: A case report. Clin Case Rep. 2024 Jun 11;12(6):e9079.
33. Siddig EE, Aradaib IE, Ahmed A. A study of case management challenge for black grain eumycetoma during the ongoing war in Sudan. Clin Case Rep. 2024 Sep 16;12(9):e9438.
34. Sunny B, Sulthana L, James A, Sivakumar T. Maggot Infestation: Various Treatment Modalities. J Am Coll Clin Wound Spec. 2018 Mar 30;8(1-3):51-53.
35. Al-Dabbagh J, Douri T. The first reported case of furuncular myiasis in Syria with no international travel history of the patient to an endemic area. Oxf Med Case Reports. 2023 Nov 28;2023(11):omad126.

Figure legends:

Figure 1: **A:** Showing the appearance of an insect bite on the left arm, B): Larvae extracted from the bite site