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Ultrasound in Emergency Medicine

Point-of-care ultrasound utilized for foreign body in a toe: A case report of botfly larvae

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□ **Abstract—Background: Myiasis, as defined by the Centers for Disease Control and Prevention, is infection with fly larvae commonly occurring in tropical and subtropical areas. Whereas the presentation of skin infection with organisms such as *Dermatobia hominis* (human botfly) is more easily recognized in these regions, identification of myiasis in the United States is difficult due to its rarity. Due to unspecific signs and symptoms, myiasis may initially be mistaken for other conditions, like cellulitis. Case Report: This case details a patient with pain, swelling, drainage, and erythema of the right second toe. The patient recently returned from Belize and reported an insect bite to the area approximately 1 month prior. She had been seen by health care professionals twice prior to presenting to our Emergency Department (ED) due to increasing pain. At those visits, the patient was prescribed antibiotics, failing to improve her symptoms. In the ED, point-of-care ultrasound (POCUS) of the soft tissue was performed and showed evidence of a foreign body consistent with cutaneous myiasis. Given the patient's history of travel to Belize and known insect bite, it is prudent to have an increased suspicion for cutaneous myiasis. Why Should an Emergency Physician Be Aware of This?: To prevent a delay in diagnosis and unnecessary antibiotics, clinicians should have a high level of suspicion for botfly if a patient reports recent travel in an endemic region and pain disproportionate to an insect bite. POCUS contributes to a more efficient recognition of the disease. © 2022 Published by Elsevier Inc.**

□ **Keywords——Point-of-care ultrasound; Human botfly; Cutaneous myiasis; Furuncular lesion**

Introduction

Cutaneous myiasis refers to the infection of human tissue with fly larvae, possibly caused by *Dermatobia hominis* (human botfly) (1). The timely diagnosis of *D. hominis* myiasis can be challenging due to the infrequency of presentation. Although this condition is commonly seen in endemic areas such as Central and South America, it has a low incidence in the United States (2). Most people who develop myiasis in the United States were infected during overseas travel in areas such as South America (2). Common presenting signs include a boil-like cutaneous swelling or hard raised skin lesion, with or without secretions and a central punctum (3,4). Doppler ultrasonography with a high-resolution (10-MHz) soft-tissue transducer has been shown to confirm myiasis with high specificity and sensitivity (5). This case describes a patient with suspected botfly bite in Belize who presented to several health care institutions upon return to the United States prior to definitive diagnosis with the use of point-of-care ultrasound (POCUS).

Case Presentation

A 47-year-old woman with prior history of anxiety, depression, mixed hyperlipidemia, and tobacco use presented to the Emergency Department (ED) with a com-

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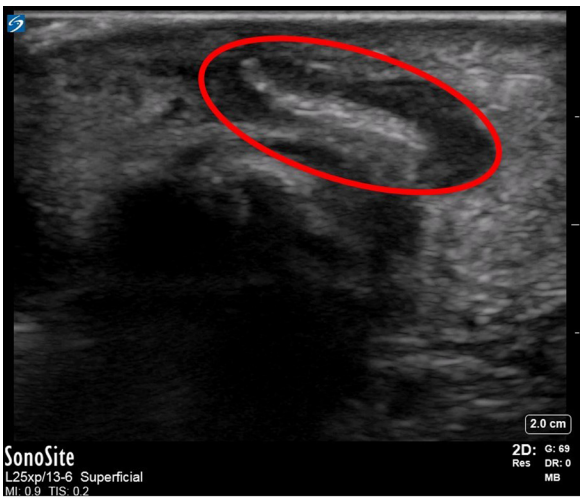
Figure 1. Physical examination of the involved toe: initial and after cleansing.

plaint of ongoing pain, bloody drainage, swelling, and erythema of the right second toe. The patient reported being bitten by an insect while in Belize approximately 1 month prior. Her tour guide in Belize recommended covering the bite with duct tape, which yielded white discharge when removed.

Upon return to the United States, the patient was treated at an urgent care center 12 days after the bite and prescribed doxycycline and a Medrol dose pack. After 2 days with no improvement of symptoms, she presented to another institution's ED, where she was treated with a 7-day course of oral clindamycin. The patient was seen for a yearly physical examination 4 days prior to the second ED admission and skin lesions were noted. She was referred to Infectious Disease for further evaluation but was unable to schedule an appointment until approximately 3 weeks later. Due to ongoing pain, the patient was referred to the ED by her provider. In the ED the patient reported intermittent headaches but denied fever, chills, nausea, vomiting, and diarrhea.

Upon examination, vital signs were significant for hypertension (164/110 mm Hg) and laboratory values were unremarkable. The lesion on the right foot dorsal second toe measured 0.3 × 0.1 cm with granular and mild fibrotic tissue with surrounding rubor and calor (Figure 1). Right foot x-ray studies revealed soft tissue swelling of the second toe and at the first metatarsophalangeal joint, minimal hallux deformity, and minimal spur formation on the distal first metatarsal. POCUS of the soft tissue was performed at bedside and showed evidence of a foreign body (Figures 2 and 3).

The patient was started on intravenous cefazolin and oral ibuprofen, and admitted to the hospital. She underwent an operation by Podiatry, who removed the foreign body with irrigation and debridement. Infectious disease was consulted and recommended additional antibiotics for concern of bacterial superinfection. Pain control and wound care was provided and the patient was discharged



(A)

(B)

Figure 2. (A) Point-of-care ultrasound showing foreign body (larva circled). (B) Representative image of a botfly. Image credit: "Dermatobia larvae" by Acarologiste. Licensed under CC BY-SA 4.0.

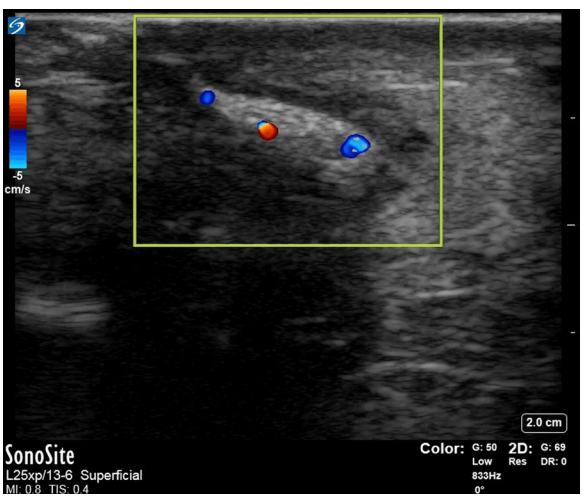


Figure 3. Color flow within the botfly, indicating living organism.

on day 3. The patient had an uncomplicated recovery noted at follow-up 13 days post operation. Pathology report confirmed the foreign body was consistent with botfly larvae.

Discussion

This case illustrates a presentation of human botfly myiasis in which confirmation of the causative organism was delayed despite the bite and subsequent defect being reported to health care providers. Although *D. hominis* is common in tropical regions, it is rarer in temperate regions, making it difficult to identify (6). A brief review of the organism life cycle follows. The female botfly uniquely lays eggs on an arthropod vector, the vector lands on a warm-blooded host, the eggs hatch, and larvae that emerge burrow into subcutaneous tissue within 10 minutes (7). The larvae may stay in this stage for 4–14 weeks prior to emerging from the skin and becoming an adult fly (1).

Several distinctive aspects of the case may cause clinicians to suspect infection with *D. hominis*. Botfly infestation may classically present with a boil-like furuncular lesion acquired in an endemic area (3). It is often misdiagnosed initially as a bacterial infection, as in our patient, but will not respond well to antibiotics. It has been suggested that 2 classic characteristics are return from an endemic region and pain disproportionate to an insect bite (6). In many botfly myiasis cases, the patient recalls being bitten by mosquitos or many bugs and reports this during the health care encounter (3,7,8).

Ultrasonography, especially the use of color Doppler, is exceptionally useful to confirm suspicion of *D. hominis*, as it is readily available and non-invasive, with the ability to visualize movement (9). Early reports of ultrasound to localize and measure the larvae were recommended to identify the best treatment plan (7). Doppler ultrasound with high resolution has proven to be 100% effective in identifying furunculoid myiasis and may expedite the diagnosis (5,10). In our case, the easy access of POCUS led to earlier confirmation of the presumed botfly larvae.

Several methods of extraction are currently used. Surgical removal with local anesthetic and wound debridement is the most efficacious and should be considered if resources are available (4,10). Other treatment options involve attempting to occlude the wound and deprive the area of oxygen. This can be done with adhesive tapes, compresses, petroleum jelly, or other occlusive substances (5,10). With this method, care must be given to ensure that no tissue is left behind to avoid a foreign body reaction or secondary bacterial infection (8). In our patient, the larva was surgically removed, and the patient had no complications.

Why Should an Emergency Physician Be Aware of This?

Myiasis is a rare finding in the United States. To prevent a delay in diagnosis and unnecessary antibiotics, clinicians should have a high level of suspicion for botfly if a patient reports recent travel in an endemic region and pain disproportionate to an insect bite. POCUS can contribute to a more efficient recognition of the disease.

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References

1. Garvin KW, Singh V. Case report: cutaneous myiasis caused by *Dermatobia hominis*, the human botfly. Travel Med Infect Dis 2007;5:199–201.
2. Centers for Disease Control and Prevention (CDC). Parasite – Myiasis. Myiasis FAQs. Available at: https://www.cdc.gov/parasites/myiasis/faqs.html. Accessed August 31, 2021.
3. Maier H, Hönigsmann H. Furuncular myiasis caused by *Dermatobia hominis*, the human botfly. J Am Acad Dermatol 2004;50(2 suppl):S26–30.
4. Shenouda M, Enten G, Nguyen T, Mangar D, Camporesi E. Human botfly: a case report and overview of differential diagnosis. J Investig Med High Impact Case Rep 2018 Oct 7;6.
5. Quintanilla-Cedillo MR, León-Ureña H, Contreras-Ruiz J, Arenas R. The value of Doppler ultrasound in diagnosis in 25 cases of furunculoid myiasis. Int J Dermatol 2005;44:34–7.
6. Ragi SD, Kapila R, Schwartz RA. The botfly, a tropical menace: a distinctive myiasis caused by *Dermatobia hominis*. Am J Clin Dermatol 2021;22:81–8.
7. Bowry R, Cottingham RL. Use of ultrasound to aid management of late presentation of *Dermatobia hominis* larva infestation. J Accid Emerg Med 1997;14:177–8.
8. Ofordeme KG, Papa L, Brennan DF. Botfly myiasis: a case report. CJEM 2007;9:380–2.
9. Richter J, Schmitt M, Müller-Stöver I, Göbels K, Häussinger D. Sonographic detection of subcutaneous fly larvae in human myiasis. J Clin Ultrasound 2008;36:169–73.
10. Jones CH, Leon M, Auerbach J, Portillo-Romero J. Ultrasound detection of human botfly myiasis of the scalp: a case report. Cureus 2020;12:e11905.

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