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FURUNCULAR MYIASIS CAUSED BY *DERMATOBIA HOMINIS* IN A RETURNING TRAVELER

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Abstract. Furuncular myiasis caused by *Dermatobia hominis* is endemic throughout Central and South America. We report a case of furuncular myiasis in a traveler returned from Costa Rica. The case is unique because the primary care physician obtained magnetic resonance images. The images, however, do not show any characteristic features that assist in diagnosis.

Myiasis is defined as infestation of a vertebrate host by fly larvae that feed on living tissue, body fluids, or ingested foods. Furuncular myiasis is caused by *Dermatobia hominis*, the human botfly or *Cordylobia anthropophaga*, the African tumbu fly, which produce boil-like lesions commonly misdiagnosed as a furuncle.[1] *Dermatobia hominis* is endemic through much of Central and South America. Its larvae are transmitted to vertebrate animals by hematophagous insects, most commonly mosquitoes, on whose abdomens the female botfly has deposited her eggs. When the blood-feeding vector encounters a warm-blooded animal, the change in temperature causes the botfly eggs to hatch. The larvae enter the vertebrate host either through a hair follicle, the bite site, or by directly burrowing in the skin. Over the next 4–18 weeks, the larva grows by eating the flesh of its host. At maturity it emerges from the wound, falls to the soil, and pupates. Despite its name, *D. hominis* also infests domestic livestock such as cattle and wild animals such as monkeys, rodents, and birds.[2] Because the botfly is not endemic in the United States and the lesion it makes resembles a furuncle, the diagnosis is often missed in returning travelers.

A 19-year-old man came to the student health clinic at the University of Miami (Coral Gables, FL). Three weeks earlier, he had returned from a trip to the Costa Rican rain forest with his tropical field biology class. In Costa Rica, the student had spent one week backpacking from a cloud forest approximately 2,900 meters above sea level to a lowland rain forest 30 meters above sea level where he was exposed to mosquitoes and tabanid flies, all of which can carry botfly eggs. Upon returning from the trip, he reported that one mosquito bite on his left lower leg did not heal and instead enlarged. The patient noted an intermittent serosanguinous discharge and a painful but brief biting sensation that occurred an average of two times per day. The patient denied fever, vomiting, headaches, and other constitutional symptoms.

On examination, the patient had a 1.3-cm erythematous nodule with a central pore on the lateral aspect of the lower left leg. The patient did not have regional lymphadenopathy or fever. The nurse practitioner who saw the patient diagnosed an infected mosquito bite and prescribed a warm saltwater dressing and a course of cephalexin. The patient completed the prescribed treatment without improvement. He then saw his private physician who performed magnetic resonance imaging (MRI) of the left lower leg, which is shown in Figure 1. The MRI showed a subcutaneous segmented nodule; however, its morphology did not aid in the diagnosis. Although the physician did not diagnose *D. hominis*, he suspected a tropical parasite and had the patient return to his tropical field biology professor who was familiar with parasites native to Costa Rica. The professor diagnosed *D. hominis* and instructed the patient to apply several layers of nail polish to the area so that it covered the central pore and

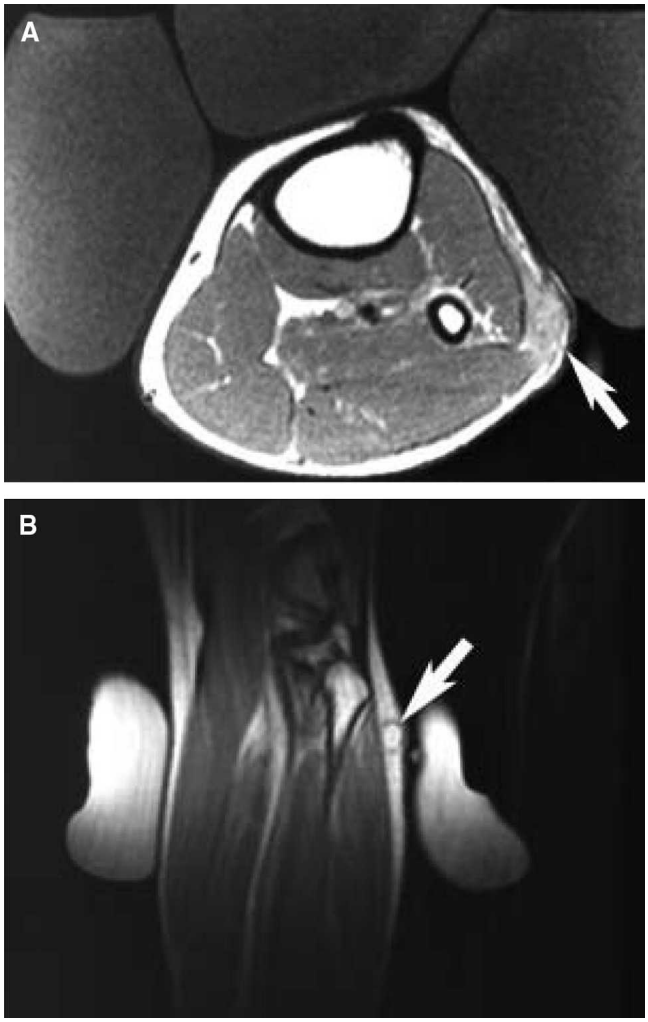

FIGURE 1. **A**, axial magnetic resonance imaging (MRI) of the left leg of the patient showing a botfly larva (**white arrow**). **B**, coronal MRI showing the botfly larva (**white arrow**).

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extended at least 1.0 cm to each side of the pore. The nail polish was left on overnight and the next day it was removed with a single swift motion. The protruding larva was grasped immediately with forceps and completely extracted with gentle, continuous tension together with manual pressure exerted on the sides of the nodule. The patient recovered completely with an uncomplicated course.

Application of nail polish to the central pore of the nodule leads to partial asphyxiation of the larva, thereby causing it to retract its spines and attempt to reposition its breathing tube to reach air. Although it may succeed in penetrating the first few applications of nail polish, eventually it is trapped and asphyxiated. This facilitates subsequent manual extraction of the entire larva provided that it is grasped well down its length. The breathing tube is fragile and breaks easily, contraindicating the use of duct tape which some use for larva removal. A larva of *D. hominis*, resting upon the removed nail polish, is shown in Figure 2.

Although the botfly will, when mature, exit the site by itself, this is usually not acceptable to the patient. Botflies, when properly diagnosed, either are surgically removed or asphyxiated and then manually removed. Traditional treatments involve asphyxiation by covering the air hole with pork fat,[3] peanut butter, nail polish (which was used in this case), or petrolatum followed by removal with a tweezers while applying pressure to force the larva upward and out.[4,5] This simple and non-invasive method is preferred for most cases. There are unusual circumstances such as when lesions are located in the eyelid or the tip of the penis, however, that may warrant surgical removal.[6,7] In either case, it is important not to leave parts of the larva behind as these can lead to inflammation and secondary bacterial infection.

We do not advocate the use of the MRI in cases of furuncular myiasis because as we show here, it does not aid in the diagnosis. Moreover, the cost of a lower extremity MRI as reimbursed by insurers exceeds $800, a cost that is avoidable for an infestation that can be diagnosed on clinical grounds. This case illustrates how lack of awareness of tropical diseases can lead to inappropriate and unnecessary diagnostic tests. Some physicians have found, however, that Doppler ultrasound can aid in the diagnosis of furuncular myiasis and is especially helpful in ensuring that all larvae are extracted from a multiply-infected lesion, a situation that is observed infrequently.[8]

Furuncular myiasis should be considered in a patient who has traveled recently to a botfly-endemic area and who has a furuncular lesion. The furuncle has a central pore that intermittently exudes a serosanguinous discharge (the feces of the larva), and protrusion of the breathing tube of the larva frequently can be observed with the aid of a hand lens. Although characteristic lesions are occasionally accompanied by enlargement of the draining lymph node, there are no other systemic symptoms. The lesions are not responsive to antibiotics. Because ecotourism to Central and South America and immigration to the United States from parasite-endemic countries has become increasingly common, the incidence of *D. hominis* infection within the United States is likely to increase.

FIGURE 2. An extracted botfly larva with a size of 4 × 14 mm resting upon the thick pellicle of nail polish used to partially asphyxiate it. The mouthparts of the larva are on the left and its breathing tube/anus is on the right. The body of the larva is ringed with several concentric rows of posterior facing spines with which it anchors itself to the host. Not visible in this photograph are the two oral hooks in its anterior end (on the left) that it uses to tear host tissue and two additional hooks on its posterior end (on the right) that keep the central pore of the lesion open. This figure appears in color at www.ajtmh.org.

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