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The Clinical Picture

A traveler with nonhealing skin nodules

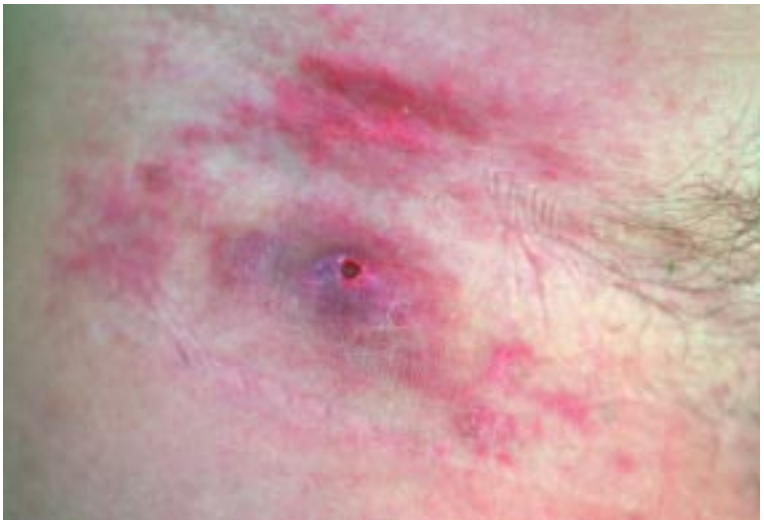

FIGURE 1. A skin lesion similar to those of our patient.

FROM GUIDI B, OLIVETTI G, SBORDONI G, GARCOVICH A. GUESS WHAT! DIAGNOSIS: CUTANEOUS MYIASIS DUE TO DERMATOBIA HOMINIS. EUR J DERMATOL 2001; 11:259–260. REPRODUCED WITH PERMISSION FROM A. GARCOVICH AND B. GUIDI, DEPARTMENT OF DERMATOLOGY, CATHOLIC UNIVERSITY OF SACRED HEART ROME, AND FROM THE EUROPEAN JOURNAL OF DERMATOLOGY.

Q: A 50-YEAR-OLD WOMAN presented with nonhealing skin nodules on her left shoulder that first appeared on a trip to rural Panama 5 weeks previously. She remembered receiving mosquito bites in the same area on her shoulder, which she thought unremarkable at the time; the nodular lesions were noticed after the mosquito exposure.

The patient sought treatment at an urgent care center when the lesions began to exude a serous fluid. She was diagnosed with cellulitis and was prescribed a course of amoxicillin and clavulanic acid. However, she experienced only minimal improvement and sought a second opinion.

The patient had two skin lesions on the left shoulder, each approximately 2 cm in diameter, erythematous, tender, and nodular without fluctuation (FIGURE 1). There was serous drainage, but no inflammation along vascular or lymphatic channels. Careful examination revealed a possible central pore in each lesion.

What is the most likely diagnosis and the best diagnostic or therapeutic procedure?

- ❑ Benign inflammatory nodule—inject hydrocortisone into the lesions and follow up in 4 to 6 weeks
- ❑ Furuncular myiasis (fly larval infestation)—immerse the affected area in water and observe for bubbling
- ❑ Staphylococcal furuncle—perform a fine-needle aspiration and Gram stain; continue antibiotics
- ❑ *Loxosceles reclusa* (brown recluse spider) bite—give dapsone 100 mg twice a day
- ❑ *Centruroides suffusus* (scorpion) envenomation—percuss the lesion and observe for paresthesia and hyperesthesia.

A: **Corticosteroid injection** into a lesion should be done only after any form of infection has been ruled out.

Staphylococcal furuncle is a reasonable consideration but is not supported by the history in this case. Staphylococcal furuncles often present with more severe symptoms and constitutional signs, which are not present in this case. Furthermore, staphylococcal furuncles should respond to antibiotic treatment, which is not happening.

Spider bite. This patient did not present with the usual symptoms that follow brown recluse spider bites. In addition, dapsone is recommended within the first 72 hours after the bite, but not later.

Scorpion envenomation. The history does not suggest scorpion envenomation, as most patients stung by a scorpion have maxi-

FIGURE 2. Human botfly larva, about 15 mm long, and likely in third instar. Note mouth hooks and rows of spines.

mal symptoms within 5 hours of the event. Although percussing the lesion may be useful in eliciting symptoms of scorpion envenomation, one would expect the patient to have presented much earlier and with more severe systemic symptoms.

Furuncular myiasis. If a lesion of furuncular myiasis is immersed in water, the examiner may see bubbles emerging from the central pore, revealing the breathing of the fly larva. The lesions can remain for weeks after the initial infestation.

The patient was diagnosed with furuncular myiasis and was advised to apply petroleum jelly to the affected areas to hasten the emergence of the larvae. This treatment was successful: one larva emerged from each lesion, and when the patient returned for follow-up 5 days later she brought one of the recovered specimens with her (FIGURE 2).

Do not try to remove a botfly larva mechanically

HUMAN BOTFLY INFESTATION

This patient presented with the typical history and physical signs seen in human botfly infestation, which is relatively uncommon but well documented in the United States.[1,2]

Life cycle of *Dermatobia hominis*

The human botfly (*Dermatobia hominis*), native to Central and South America, has a fascinating and complicated life cycle. Typically, adult human botflies can produce eggs but have no direct means of introducing them into a host. Instead, the adult botfly captures another species of biting fly and glues its eggs to its body. This causes no harm to the host insect and allows the eggs to be transported to a suitable second host, a relationship known as phoresy.[3]

Later, when the fly bites a mammalian victim, typically a human or bovine, the body heat induces the eggs to hatch. The botfly larvae drop onto the skin of the bitten subject and burrow into the victim's skin by way of the recent bite, via a hair follicle, or through intact skin. The larvae are then safe to feed and grow; however, they must keep respiratory tubes intermittently open to the air to breathe.

Typically, larvae undergo three moltings and require 5 to 12 weeks before they emerge from their host, drop to the ground, and pupate. An adult fly, incapable of feeding on its own and reliant on nourishment stored at the larval stage, emerges to complete the cycle.

Features of botfly infestation

Cases of botfly infestation in the United States typically occur only in patients who have recently traveled to endemic areas.[1,3] The patient may or may not recall being bitten by an insect. The lesions are typically nodular, often progressing to form a furuncle 1 to 2 cm in diameter and raised up to 0.5 cm from the skin.[2] Typically, some drainage is present, and this sign may help differentiate this lesion from furunculosis. The respiratory tubule or breathing motion of the larvae may or may not be visible, but if seen is essentially diagnostic.[1,2]

The larvae develop a thick body tapered towards the breathing tube. They anchor themselves firmly in the tissue with several rows of curved, thorn-shaped spines that face the surface. These features make the larvae difficult to remove by mechanical means.

These parasites are not uncommon in their natural habitat. Thus, in this era of jet transportation, myiasis must be suspected in any patient with a compatible travel history and nonresolving nodular skin lesions.

Other insects with different life cycles can also cause myiasis.[4] For example, the African tumbu fly (*Cordylobia anthropophaga*) does not practice phoresy; instead, it lays its eggs in sand or clothing, and the larvae hatch on contact with skin. Although the resulting skin

lesions may appear similar to botfly lesions, the tumbu fly larvae emerge after only about 8 days. Maggots from another parasitic fly, the horse botfly (*Gasterophilus intestinalis*), migrate for weeks without maturing after they penetrate a human host. Other species have varied mechanisms of causing human myiasis as well.

Treatment

The human host is typically not harmed by the parasitism, although secondary bacterial infection is a distinct possibility. However, most patients find the idea of myiasis discomforting and want the parasite removed.

As in our patient, one approach is to obstruct the respiratory tubules with petroleum jelly or waxy substances and force the larvae to the surface.

Surgical removal with packing of the wound is often required if the larvae are contained in an anatomic area that would be damaged by their growth.

Care must be taken, as the larvae are well anchored into the subcutaneous tissue—failed attempts to coax or pull them from the lesion could cause remnants of the insect to be left behind and become a nidus for infection.

REFERENCES

1. **Ruch D.** Botfly myiasis. Arch Dermatol 1996; 96:677–680.
2. **Kenney RL, Baker FJ.** Botfly (*Dermatobia hominis*) myiasis. Int J Dermatol 1984; 23:676–677.
3. **de Campos Pereira M.** *Dermatobia hominis.* University of Sao Paulo Institute of Biomedical Sciences, Department of Parasitology. http://icb.usp.br/~marcelcp/Dermatobia.htm. Accessed June 6, 2002.
4. **Maguire JH, Spielman A.** Ectoparasite infestations and arthropod bites and stings. In: Fauci AS, et al editors. Harrison's Principles of Internal Medicine, 14th ed. New York: McGraw-Hill 1998:2548–2554.

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