Furuncular Myiasis: A Simple and Rapid Method for Extraction of Intact Dermatobia hominis Larvae

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We report a case of furuncular myiasis complicated by *Staphylococcus aureus* infection and β-hemolytic streptococcal cellulitis. The *Dermatobia hominis* larva that caused this lesion could not be extracted using standard methods, including suffocation and application of lateral pressure, and surgery was contraindicated because of cellulitis. The botfly maggot was completely and rapidly extracted with an inexpensive, disposable, commercial venom extractor.

Myiasis constitutes an invasion of living, necrotic, or dead tissue by fly larvae, or maggots [1]. There are several species of dipteran flies whose maggots can parasitize the skin, vagina, urinary tract, gastrointestinal tract, nasopharynx, sinuses, eyes, and auditory canals of humans [1, 2]. However, the most common type of myiasis observed in returning travelers is furuncular myiasis caused by *Cordylobia anthropophaga* (tumbu fly) or *Dermatobia hominis* (human botfly). The range of the tumbu fly is restricted to sub-Saharan Africa, whereas the human botfly is commonly found in Mexico and throughout much of Latin America [3].

Furuncular myiasis commonly presents as a small, raised, red, bitelike lesion that evolves into an enlarging, pruritic, erythematous, tender nodule from which a sensation of movement and lancinating pain can be felt [3–6]. Most patients complain of a serous discharge that issues through a central punctum either spontaneously or with application of lateral pressure. It is of no surprise that most infested individuals, who are uncomfortable about waiting the required 8–12 weeks for the larvae to mature and exit on their own, request that the larvae be extracted at the time of diagnosis. Conventional methods of removing the offending maggot, which include application of lateral pressure [4] and suffocation by occlusion of the punctum with mineral oils [4], petroleum jelly [3], or pork fat [6], are often ineffective and necessitate more-invasive interventions, such as surgical excision [1, 2, 7]. We report a simple and extremely rapid method of extracting intact dipteran fly larvae, even in the presence of secondary cellulitis.

Case report. A 34-year-old male archeologist presented to an outpatient clinic for assessment of a skin lesion on his lower leg that had developed ~1 week before presentation (figure 1). A bacterial abscess was diagnosed, and the patient was treated with oral antibiotics for 2 weeks without any clinical response. In light of both the unresponsiveness of the patient and his recent history of travel to Belize, the patient was referred to the Tropical Disease Unit at the Toronto General Hospital (Toronto, Ontario, Canada) for reassessment. At that time, the patient described how, during the 4 weeks before reassessment, the lesion had evolved from a small, painful bump to a large, red lesion that intermittently drained serosanguineous fluid. He complained of having a sensation of movement within the lesion and of experiencing accompanying stabbing pains. In the 3 days before the patient was assessed at the Tropical Disease Unit, the lesion and the surrounding skin had become increasingly red, swollen, and tender.

Physical examination of the patient revealed the presence of a fixed, indurated, erythematous nodule (diameter, 2 cm) on the lower leg. The nodule had a central punctum of ~2 mm in diameter through which serous fluid drained. Extensive associated cellulitis and edema up to the knee were noted. The patient was afebrile. A swab specimen was obtained from the nodule and of experiencing accompanying stabbing pains. In the 3 days before the patient was assessed at the Tropical Disease Unit, the lesion and the surrounding skin had become increasingly red, swollen, and tender.

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On the day after the occlusive dressing had been worn for ~18 h, the dressing was removed and the posterior end of a *D. hominis* maggot was seen protruding through the punctum. The larva was clearly alive and motile, which indicated that suffocation therapy had failed. Although a considerable amount of lateral pressure was applied to the margins of the lesion, the larva could not be extracted. In an effort to facilitate removal, the attending clinician applied a snake-venom extractor (The Extractor; Sawyer Products) to the lesion according to the man-
Figure 1.  
A, Photograph of presenting lesion with associated cellulitis. B, Failed extraction with suffocation and lateral pressure of lesion. The arrow denotes the posterior end of the maggot protruding through the central punctum. C and D, Application of a venom extractor results in rapid (<1 s) extraction of an intact and viable 1.5-cm larva. The arrowhead denotes the central punctum, with the intact maggot to the left (arrow).

Discussion. This case is informative for several reasons. First, with the increase in international travel—in particular, travel for adventure and ecotourism—cutaneous myiasis is becoming a commonly observed skin problem among returning travelers, and it currently accounts for 5%–10% of skin lesions seen at our health care center [3]. Second, myiasis is frequently misdiagnosed as a bacterial abscess or furuncle and is subsequently treated with an ineffective course of antibiotics [4]. Serosanguineous discharge from the central punctum and sensations of movement within the lesion are important clinical clues to the diagnosis. Third, well-described extraction methods that are based on suffocation and application of lateral pressure take time to perform and may fail. Finally, myiases may be complicated by cellulitis that may obscure the underlying diagnosis and complicate the use of alternative extraction methods, such as surgical excision.

Lesions of the botfly are often localized to the scalp, face, forearms, and legs, which may reflect the unique life cycle of this organism. The botfly preferentially deposits its eggs on the underside of a mosquito [1]. Botfly eggs drop off the mosquito as it feeds on an animal (a bird or a human [or other mammal]), and the eggs then hatch, producing larvae that penetrate the skin and reside in the subcutaneous tissue for ~100 days [1, 7]. After a prolonged stay in the host, the third-stage maggot exits via the punctum, falls to the ground, and pupates during the next 2–3 weeks [5]. After pupation, *D. hominis* emerges as an adult and lives for 8–9 days, during which time it mates and pastes its eggs to the abdomens of mosquitoes or other blood-sucking arthropods to complete the life cycle [8]. Because *D. hominis* is a forest-dwelling fly found in Central and South America, individuals who participate in ecotourism and rural outdoor occupations, such as archeology and mining, in these areas are at risk of developing myiasis. This disease can be prevented through the use of personal protection measures to reduce mosquito bites.

Although the larvae generally require ~12 weeks to mature, most are removed before that time. An ideal treatment method should allow prompt and complete removal of the maggot to decrease anxiety, inflammatory response, and the risk of abscess formation. Conventional strategies to remove the offending maggot include surgical excision or suffocation of the maggot by occlusion of the punctum [1, 3, 4, 6]. Occlusion of the punctum impairs the ability of the larva to respire and thus stimulates its migration out of its sinus [3]. Materials that have
been used to suffocate the maggot include mineral oils [4], petroleum jelly [3], pork fat [6], superadhesive glue, nail polish, and chewing gum [1, 7]. However, conventional methods of maggot extraction are often inadequate [1]. Girth and anchoring spines counteract the forces that work to extrude the maggot, which explains why application of direct lateral pressure to the lesion often fails to expel the larva. Moreover, suffocation methods that theoretically draw the maggot out of its sinus rarely cause complete extrusion. After partial extrusion, the maggot is often grasped with forceps or some other such device that can cause the larva to break and can incite an inflammatory reaction that can be severe. Surgical excision, although effective, is invasive, expensive, and does not lend itself to use in the field. Furthermore, larvae can be lacerated, which leads to inflammation and incomplete extraction. As in the case we present here, surgical excision poses an additional risk to patients with concurrent cellulitis, because making incisions in erythematous, infected skin generally is contraindicated. Finally, injection of xylocaine, by use of a needle, into the larval cavity has been reported to be effective; however, this method may result in trauma to the larvae and secondary inflammation and is not readily applicable in the field [9].

The use of a venom extractor offers several advantages over traditional therapies. First, it is exceedingly quick and painless, and it allows for removal of the larva at the time of presentation. Furthermore, it removes the maggot in its entirety and does not leave behind larval fragments that result from instrumentation of the cavity or larva itself. Venom extractors are noninvasive and therefore are safe to use for patients who have complicating cellulitis. Finally, venom extractors are inexpensive, are readily available, and can be used by infested individuals in the field. We do not yet have sufficient experience with this technique to conclude that overnight application of an occlusive dressing before use of a venom extractor is unnecessary. In this case, suffocation of the maggot clearly failed; nonetheless, the venom extractor rapidly removed the maggot, which suggests that this technique will work without prior use of an occlusive dressing. Although further documentation of this method of extraction will be necessary before it is accepted as an evidence-based practice, venom extractors have the potential to become a treatment of choice for cutaneous myiasis.

References