

Exploring Tropical Infections: A Focus on Cutaneous Larva Migrans

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1.5 Contact Hours

GENERAL PURPOSE: To provide information about infection with cutaneous larva migrans (CLM).

TARGET AUDIENCE: This continuing education activity is intended for physicians, physician assistants, NPs, and nurses with an interest in skin and wound care.

LEARNING OBJECTIVES/OUTCOMES: After participating in this educational activity, the participant will:

1. Distinguish the clinical features, diagnosis, and management of CLM.
2. Explain the epidemiology of CLM.

ABSTRACT

Cutaneous larva migrans is a hookworm infection and one of the most common skin diseases of tourists in tropical countries. Most commonly, the infection is transmitted by contact with feces of dogs and cats containing hookworm eggs. This case-based review explores the epidemiology, diagnosis, clinical features, and management of cutaneous larva migrans infection.

KEYWORDS: cutaneous larva migrans, epidemiology, hookworm, infection, prevention, pruritus

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CASE REPORTS

Case 1

A previously healthy 24-year-old man developed a pruritic serpiginous blistering rash on his foot 1 month after his trip to Peru. He had visited friends and family and spent his time in Chiclayo, a coastal region. He had been living in Canada for 3 years and visited Peru annually. During his trips, he often spent time on the beach.

Because the rash did not resolve, he sought medical care and was initially treated with mebendazole for suspected cutaneous larva migrans (CLM) infection with no improvement. He was then referred to a dermatologist and eventually to a tropical infectious disease clinic. On examination, he had a serpiginous rash over the dorsum of his right foot as well as a large bulla adjacent to the rash (Figure 1).

Based on his travel history and clinical presentation, his providers confirmed the CLM diagnosis. Treatment was initiated with albendazole 400 mg twice daily for 5 days. At follow-up 1 week later, the rash had not progressed. The lesions fully resolved 9 weeks after therapy initiation.

Case 2

A 37-year-old man presented with a pruritic serpiginous rash 3 weeks following a trip to Jamaica where he spent a week at an all-inclusive resort. He spent much of his trip on the public beaches with domestic pets (ie, dogs) present. No other unusual food or animal exposures were

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Figure 1. SERPIGINOUS RASH ON DORSUM OF FOOT WITH LARGE BULLA (SEROUS FLUID)



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reported. He was seen by his family physician and was referred to the tropical infectious disease clinic.

On examination, he had notable serpiginous rashes present on his legs. He had been treated with cephalexin for suspected bacterial infection with no improvement. He was diagnosed with CLM and prescribed ivermectin 15 mg daily for 2 days. He noted improvement over the following week with drying of the lesions and no new lesions. On follow-up at 4 weeks, he had complete resolution of his symptoms (Figures 2 and 3).

INTRODUCTION

Cutaneous larva migrans is a skin disease associated with a migrating serpiginous rash on the feet or (less commonly) other parts of the body such as the buttocks. Affected individuals present with an intensely pruritic rash. Transmission of the disease to humans occurs via zoonotic transmission of hookworm larvae, usually the *Ancylostomatoidea* family. Known causative species are *Ancylostoma braziliense* or *A. caninum*, which are endemic to most coastal regions in the world.¹ Because the hookworms cannot complete their life cycle in humans, CLM is self-resolving and does not require treatment in most cases (Figure 4).¹

Tropical and subtropical regions such as Southeast Asia, Africa, South America, the Caribbean, and the southeastern US have the highest prevalence of CLM. Each area differs in its local name for the disease; creeping eruption, creeping verminous dermatitis, sand worm eruption, and plumber's itch are most common.² The disease is reported most often during rainy and warm seasons. It is the most frequent skin disease among tourists visiting tropical countries, accounting for 10% of cases of travelers with skin disease.³ This is predominantly because of the number of

tourists on foreign tropical beaches without proper footwear or knowledge of hookworms.

Different risk factors contribute to CLM globally. General risk factors for CLM include skin exposure to hookworm-infected soil, living in a house without a solid floor, and tourism. In lower-income countries, walking barefoot, children crawling with minimal or no clothing, and having infected household pets are associated with CLM because these factors allow for more exposure to infected sand or soil. In higher-income countries, CLM cases can increase during periods of warm weather or rainfall.⁴ Most cases of CLM in high-income countries are acquired during travel to low-income countries. In a study from Berlin,⁵ more cases coincided with higher temperatures and rainfall. This suggests that with climate change CLM may become more commonplace globally.

CLINICAL FEATURES

An erythematous migrating serpiginous rash with pruritus is characteristic of CLM and present in greater than 98% of cases.⁶ The rash can progress anywhere from a few millimeters to a few centimeters each day depending on larval migration patterns.¹ Those affected usually present with a singular track that is slightly elevated and a few millimeters in width,⁷ but multiple tracks may also be present.⁸ Tracks are most prevalent on the feet, buttocks, and thighs.⁷ Presentation on mucosal surfaces, the scalp, and genitals is rare.¹ Other symptoms include

Figure 2. SERPIGINOUS RASH AT MEDIAL ASPECT OF FOOT



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Figure 3. SERPIGINOUS RASH AT SHIN



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blistering or pus-containing lesions and associated edema.⁸ A small, erythematous papule at the site of the larva entry may be noticed.⁶ Symptoms are not immediate upon larval entry because incubation lasts anywhere from a few days to a month.⁷

PATHOPHYSIOLOGY

The CLM life cycle (Figure 4) begins with adult zoonotic hookworms laying eggs in the intestines of dogs and cats. These eggs are shed within the feces. The hatching of the eggs and the survival of the developing larva are facilitated by warm, moist conditions, making beaches the ideal ground for infection. Once on the soil, the larvae must mature prior to penetrating host skin.¹ Upon direct contact with human skin, the larvae will penetrate the stratum corneum, which allows them to burrow through the superficial skin layers.⁹

The immune response to CLM causes the itchy, serpiginous tracks to form along the path of larval migration, and these appear a few days after larval entry of the skin.¹⁰ Unlike in animal hosts, larvae cannot penetrate the basal membrane of human hosts, so they are prevented from entering the lymphatic system and cannot complete their life cycle.

DIAGNOSIS

The diagnosis of CLM is clinical and dependent on the presence of a creeping eruption, usually accompanied by a travel history.² The incubation period ranges anywhere from a few days to a month, but will rarely occur beyond this period. There are no specific diagnostic tools, serologic tests, or biopsies that are useful for CLM diagnosis.⁷ Skin biopsies in particular are limited in their ability to track the larva's progression.

Unfortunately, CLM shares many signs and symptoms with other creeping eruptions. The disease can often be mistaken for larva currens (strongyloidiasis)² or gnathostomiasis, which also cause a migrating pruritic rash. Larva currens

caused by *Strongyloides stercoralis* has a similar serpiginous appearance but is characteristically present on the perianal area; it often grows quickly, at greater than 1 cm/h. It can be diagnosed by serology or dedicated stool testing and is treated with ivermectin. Gnathostomiasis presents as migratory panniculitis with poorly demarcated cutaneous lesions that lack a bullous appearance. It is acquired through the ingestion of uncooked fish, such as ceviche. Correctly differentiating CLM from other creeping eruptions will enable affected individuals to receive timely, effective treatment.

TREATMENT

Treatment for CLM depends on the degree of morbidity caused by the infection. Because the disease is self-resolving, it does not often require treatment because the larva dies within 2 to 8 weeks of its entry.¹ The primary goal of treatment is to provide more rapid resolution of the intensely pruritic rash.

Oral treatments include albendazole and ivermectin. Ivermectin has been well tolerated, and no adverse effects have been reported.¹¹ Its high efficacy has been demonstrated, with one study concluding that a single 12-mg dose of ivermectin was more effective than albendazole, resulting in cure rates of 81% to 100% and 46% to 100%, respectively.¹²

Albendazole is also well tolerated and has had successful trials. Its efficacy was studied in 26 individuals treated with albendazole 400 mg/d in two doses. All but two cases reported that itching subsided entirely between days 2 and 3; the two cases required the same treatment to be repeated, resulting in resolution of symptoms. In a follow-up 6 months later, no relapse was found in any of the individuals. Mebendazole is inferior to albendazole and should not be used because of decreased systemic absorption.

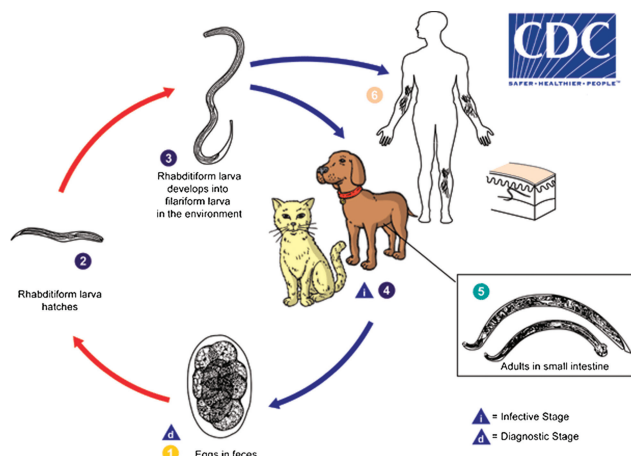
Topical treatments include freezing or thiabendazole solutions/ointments. Freezing entails applying liquid nitrogen to the leading edge of the skin track to prevent larval activity, although this is largely ineffective.³ Worldwide, thiabendazole is the most commonly administered drug for CLM because of its low cost and ready availability, with an efficacy of 89% after 4 weekly doses.³

PREVENTION

With proper education, the annual rates of CLM could be drastically lowered, especially among tourists. One strategy is to prevent cats and dogs from accessing public areas such as beaches where most infections occur.⁷ However, simply wearing proper footwear on beaches frequented by cats and dogs or avoiding beaches that allow these animals would prevent many CLM cases. Other beach practices such as walking on areas of tide-washed sand rather than dry sand and using a mattress rather than a towel to lie down would help decrease annual rates.³ Although CLM occurs predominantly in tropical and subtropical



Figure 4. LIFE CYCLE FOR ZOONOTIC HOOKWORM



regions, rising global temperatures may result in increased spread of CLM to areas where it was previously uncommon. Education and prevention will always be key to CLM management.

CONCLUSIONS

Cutaneous larva migrans is a common cause of rash in travelers returning from tropical climates. By recognizing the unique serpiginous rash, a visual diagnosis can expedite treatment and subsequent symptom resolution.

PRACTICE PEARLS

- Cutaneous larva migrans is one of the most common parasitic skin infections of travelers to tropical and subtropical areas.
- Usually, CLM presents as a pruritic serpiginous spreading rash.
- Cutaneous larva migrans is self-limited, and most cases do not require any treatment.
- Prevention through clothing and footwear to avoid soils infected with hookworms is key.
- If treatment is required, a single dose of ivermectin is most effective. ●

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