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Case Report

Cutaneous Larva Migrans - Clinical Case and Literature Review

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Abstract

Cutaneous larva migrans is a parasitic disease typical of tropical and subtropical climate zones. In Bulgaria, cases are rare and are usually found in tourists who have visited the tropics. The disease is caused by nematode larvae, most often Ancylostoma braziliense. Humans are accidental hosts in which the larvae do not reach sexual maturity, do not complete their life cycle and die. Infection occurs through contact with contaminated soil or sand or by ingestion of nematode eggs. There are two types of larva migrans: cutaneous and visceral. The cutaneous form manifests itself with characteristic itchy, erythematous, linear or zigzag crawling lesions, while the visceral form affects internal organs such as the liver, lungs, heart and brain and is more common in children without hygiene habits. The diagnosis of the cutaneous form is based on exposure history and clinical presentation, while the visceral form requires serological tests and imaging studies. We present a 61-year-old female patient with cutaneous larva migrans acquired after travel to Zanzibar. The diagnosis was based on the typical clinical presentation, epidemiological history, and histopathological findings. Laboratory tests revealed moderate blood eosinophilia and elevated inflammatory markers. Systemic treatment with ivermectin led to rapid symptom relief and complete recovery. This case highlights the importance of early diagnosis and treatment in patients returning from endemic areas.

Keywords

Cutaneous Larva Migrans, Parasitic Infection, Tropical Regions, Eosinophilia, Ivermectin, Serpiginous Lesions, Diagnosis, Treatment

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1. Introduction

Larva migrans (LM) is a parasitic disease caused by larval forms of nematodes endemic to tropical and subtropical regions. In temperate countries, including Bulgaria, autochthonous cases are rare and are usually diagnosed in individuals who have resided in endemic areas [1, 2]. Global warming, increased international tourism, and urbanization are considered important factors in the increasing incidence of infection in non-endemic regions as well [3, 4]. The etiological agents are helminth larvae, whose life cycle occurs in the intestines of carnivorous animals such as dogs, cats, foxes, and wolves. They excrete eggs in their feces, contaminating soil, sand, and other surfaces [5, 6]. In humans, who are aberrant hosts, the larvae do not reach sexual maturity and do not complete their life cycle [6, 7]. Infection occurs primarily through direct contact with a contaminated environment or through a fecal-oral mechanism facilitated by poor hygiene and close contact with domestic or stray animals [7-9].

2. Clinical Case

History A 61-year-old female patient who, in early February 2024, experienced severe itching on her right foot and noticed reddish, serpentine (serpiginous) lesions progressing to the ankle (Figure 1). According to the history, she had been on vacation in Zanzibar from January 2–14, 2024, where she often walked barefoot on the sand.

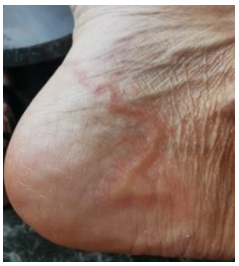

Figure 1. *Pathognomonic serpiginous raised course for Cutaneous Larva Migrans.*

Clinical Examination

The patient's general condition was good, afebrile, with normal vital signs:

(1) Heart rate: 75 beats/min.

(2) Blood pressure: 120/75 mmHg.

(3) Respiratory rate: 18 breaths/min.

Dermatological examination revealed a raised, erythematous, serpiginous line on the skin of the right heel to the lateral ankle, characteristic of the tunnel of a migrating larva.

Additional Investigations

Laboratory Tests:

(1) Eosinophilia: 5.1% (reference values: 0.4-5%).

(2) Accelerated ESR: 55 mm/h (reference values: 0-20 mm/h).

(3) Elevated CRP: 10.0 mg/L (reference values: 0-5 mg/L).

Histopathological Examination (Figure 2):

(1) Intraepidermal tunnel filled with eosinophilic fragments and fibrin • Subepidermal edema.

(2) Moderate mixed inflammatory infiltrate rich in eosinophils in the papillary dermis.

Based on the history, clinical examination, and additional investigations, a diagnosis of Cutaneous Larva Migrans was made, most likely due to contact with contaminated sand in the endemic region of Zanzibar.

Treatment and Follow-up

Treatment was performed with ivermectin (Huvemec) 3 mg, 4 tablets orally (once). Follow-up reported suppression of itching and improvement of the skin lesion within 48 hours of treatment. No side effects were observed.

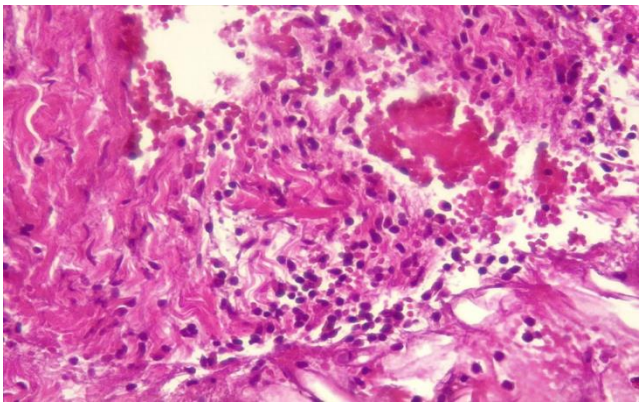

Figure 2. *Histopathological Finding: Intraepidermal Tunnel Filled with Detritus, Fibrin, and Eosinophilic Fragments (XEx100).*

3. Discussion

Larva migrans is a parasitic disease typical of tropical and subtropical regions, but in recent years an increasing incidence has been reported in countries with temperate climates. Climate change and increased international tourism are key factors contributing to this trend [10, 11]. Increased clinical vigilance is needed, including in non-endemic regions such as Bulgaria, especially in patients with a history of travel to tropical or subtropical areas, contact with animals, or stay in areas with contaminated soil and sand [1, 9]. The infection is caused by larval forms of nematodes that parasitize the intestines of dogs, cats, and other carnivores. They excrete eggs in their feces that contaminate the environment, mainly soil and sand [12]. Humans are an accidental host. Infection occurs through direct contact with a contaminated environment or by ingestion of invasive eggs, and the nematode larvae do not reach sexual maturity and do not complete their

life cycle [13, 14]. Diagnosis of LM requires a comprehensive approach, including a detailed epidemiological history, clinical evaluation, and relevant laboratory tests [8]. The public health challenges are not only diagnosis and treatment, but also effective prevention [10].

Clinically, Two Main forms of the Disease are Distinguished:

1. Cutaneous larva migrans (CLM) – nematode larvae migrate into the epidermis. The characteristic symptom is the "creeping eruption" [7].

2. Visceral larva migrans – a rarer but severe form in which the larvae migrate hematogenously and are localized in internal organs (liver, lungs, myocardium and central nervous system). It often affects children without hygienic habits [8].

Etiology of cutaneous larva migrans

Main Pathogens

(1) Ancylostoma braziliense – the leading causative agent, found in tropical and subtropical regions [15].

(2) Ancylostoma caninum – a parasite of dogs, sometimes causing deeper invasion and eosinophilic enteritis in humans [16].

Rare Pathogens

(1) Uncinaria stenocephala – a parasite of dogs in temperate climates [10].

(2) Bunostomum phlebotomum – a parasite of cattle, rarely causing infections in humans [11].

Life Cycle of Cutaneous Larva Migrans (Figure 3)

The parasite's eggs are shed in the feces of infected animals and in warm, humid climates hatch into filarial larvae (L3) capable of infecting a host [17]. Upon contact with infected soil or sand, the larvae penetrate the skin but are unable to enter the bloodstream, leading to a local inflammatory response and characteristic skin symptoms [18].

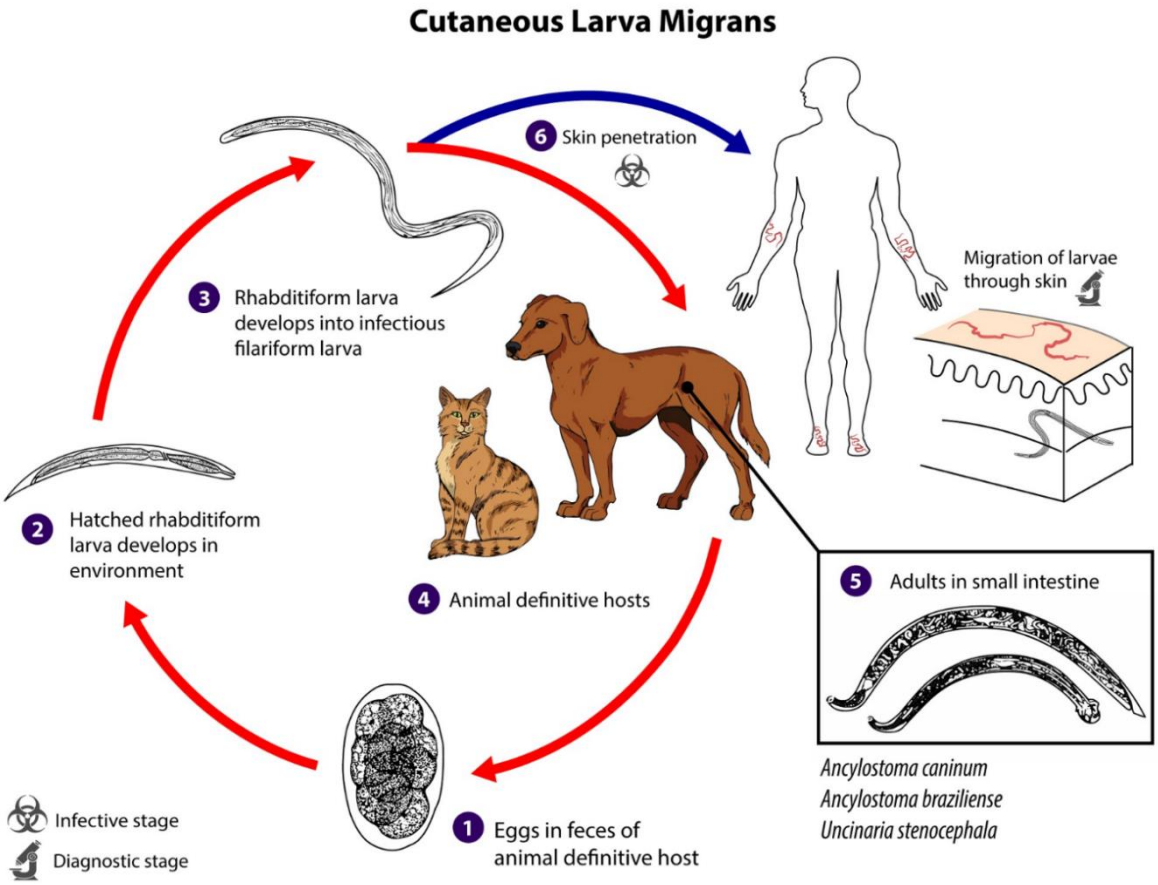

Figure 3. *Life Cycle of Cutaneous Larva Migrans.*

(Adapted from https://www.cdc.gov/parasites/ zoonotichookworm/biology.html).
CDC - Zoonotic Hookworm - Biology. Www. Cdc.Gov 17 September 2019, www.cdc.gov/parasites/ zoonotichookworm/biology.

Pathogenesis

The infection proceeds in several main stages:

1. Larval Entry Through the Skin

(1) Most common entry sites: feet (when walking barefoot), hands (when gardening), thighs and buttocks (when sitting on infected soil) [11].

(2) Rare cases of LM in the oral mucosa [14] and in the sebaceous glands of the scalp [15].

2. Migration Into the Epidermis

(1) Larvae move at a speed of 2–5 mm/day, forming erythematous, itchy, serpiginous lesions [10].

(2) In the human body, larvae are restricted to the stratum basale because they do not secrete the necessary enzymes to pass through the basement membrane and penetrate deep into the underlying tissues.

(3) Very rare cases have also been described in which, for unclear reasons, larvae may penetrate deep into the muscles.

3. Inflammatory Response

The body reacts with a local immune response:

(1) Activation of mast cells and eosinophils → histamine release → intense itching [12].

(2) Local edema and inflammation [14].

4. Persistence and Self-Limitation

Larvae cannot complete their life cycle and die within weeks to months [13].

Clinical Presentation of Cutaneous Larva Migrans

1. Incubation Period

(1) Usually from a few hours to a few days after contact with infected soil or sand [9].

(2) Rarely, weeks later if the larvae remain latent [5].

2. Initial Symptoms

(1) Mild erythema at the site of penetration [7].

(2) Burning, discomfort, tingling.

(3) Intense itching, which increases at night and with warmth.

3. Typical Skin Lesions

(1) Serpiginous tunnels - the main clinical sign.

a) Length: from a few millimeters to several centimeters.

b) Growth: 2–5 mm per day.

c) Color: erythematous or violet.

(2) Additional manifestations: erythema, edema, papules, sometimes vesicles or bullae [19].

(3) Usually single, rarely multiple lesions.

4. Location

(1) Feet - when walking barefoot [5].

(2) Hands – when gardening [13].

(3) Thighs, buttocks, back – when lying on infected soil [1, 5, 18].

5. Atypical Forms and Complications

(1) Bullous form – large bullae resembling allergic dermatitis [1, 2, 19].

(2) Follicular form – lesions around hair follicles [3, 4].

(3) Eosinophilic dermatitis – severe inflammatory response with itching [5].

(4) Secondary bacterial infection – possible development of cellulitis, impetigo, abscesses [6].

(5) Eosinophilic Enteritis (only in A. caninum) – abdominal pain, diarrhea [7].

(6) Hyperpigmentation and scarring - after the infection has resolved.

Diagnostic Methods for Cutaneous Larvae Migrans

The diagnosis of Cutaneous Larvae Migrans (CLM) is primarily clinical, based on the characteristic skin findings and a history of exposure to contaminated soil or sand. Additional investigations are indicated in atypical cases or when complications are suspected [12, 16, 19].

1. Clinical Evaluation

(1) History: travel to endemic areas, contact with soil, sand, gardening, or walking barefoot; severe itching with progressive lesions (2–5 mm/day) [8].

(2) Physical Examination: serpiginous, erythematous tunnels with itching (especially at night); common sites are feet, hands, buttocks, thighs. Vesicles, bullae, and excoriations are often seen [1, 2, 19].

2. Dermatoscopy, Reflective Confocal Microscopy, Fluorescence Enhanced Videodermoscopy, Optical Coherence Tomography Tomography

(1) Improves visualization of the larval course.

(2) Helps differentiate from larva currens in Strongyloides stercoralis [9, 10].

3. Laboratory And Additional Diagnostics

(1) PBC: eosinophilia (10–30%), more common in Ancylostoma caninum; leukocytosis in secondary infection [11].

(2) Serology: antibodies to Ancylostoma spp. – of low diagnostic value [12]. immuno-diagnostic method.

(3) Biopsy: in atypical cases – eosinophilic infiltration, larvae are rarely found [13].

(4) Bacterial culture: in suspected superinfection.

(5) Fecal analysis: usually negative, since larvae do not reach the intestines [14].

Differential Diagnosis

When suspected of CLM, it is important to differentiate it from other diseases with serpiginous lesions. Possible differential diagnoses include (Table 1):

1) Parasitic infections – Larva currens, Gnathostomiasis, Fascioliasis, Filariasis, Scabies [1, 2].

2) Infectious dermatoses – Spirochetal infections (Erythema chronicum migrans), mycotic infections (Tinea corporis), bacterial infections (Erysipelas et Cellulitis) [3].

3) Allergic and toxic dermatitis – Caterpillar dermatitis, Physaliasis, Allergic Contact Dermatitis, Contact et Spontaneous Urticaria, Phytophotodermatitis [4].

4) Autoimmune dermatoses – Bullous pemphigoid, Linear IgA dermatosis [5].

5) Vascular diseases (angiomatosis) – Linear kaposiform angiomatosis [6].

6) Cutaneous Pili Migrans [7].

Table 1. *Differential diagnosis of Cutaneous larva migrans.*

Disease	Etiology	Key Features	Localization	Migration	Systemic Symptoms	Diagnosis
Larva currens	*Strongyloides stercoralis*	Linear erythematous-edematous lesions, rapid migration	Perineum, buttocks, thighs	10 cm/day (faster than CLM)	Diarrhea, eosinophilia	Stool analysis, serology (ELISA)
Gnathostomiasis	*Gnathostoma spinigerum*	Subcutaneous nodules, edema, pain	Subcutaneous tissue	Slow migration	Neurological and ocular complications	Serology, biopsy
Fascioliasis	*Fasciola hepatica*, *F. gigantica*	Erythema, urticaria, angioedema	Various regions	None	Hepatomegaly, jaundice	Stool analysis, serology
Filariasis	*Loa loa*, *Onchocerca*, *Mansonella*	Subcutaneous nodules, angioedema	Periorbital area, lymph nodes	None	Lymphadenopathy, pruritus	Blood smear microscopy, serology
Scabies	*Sarcoptes scabiei*	Polymorphic lesions (papules, crusts, burrows)	Fingers, wrists, genitals	Linear burrows, not true migration	Intense nocturnal pruritus	Dermoscopy, skin scraping
Erythema chronicum migrans	*Borrelia burgdorferi*	Expanding concentric erythema (“target” lesion)	Around tick bite	None	Flu-like symptoms	Serology, PCR
Tinea cutis glabrae	Dermatophytes	Round, raised scaly lesions	Face, hands, feet	None	Itching	KOH test
Erysipelas and Cellulitis	*Streptococcus*, *Staphylococcus*	Painful, warm, inflammatory lesions	Limbs, face	None	Fever, leukocytosis	CRP, bacterial culture
Bullous pemphigoid	Autoimmune	Tense bullae, chronic course	Any body area	None	No contact with contaminated soil	Immunofluorescence, IgG/C3 in basement membrane
Cutaneous Pili Migrans	Ingrown hairs	Linear or curvilinear erythematous lesions	Face, limbs	None	Itching, pain	Derm

Prevention Of Cutaneous Larva Migrans

1. Personal Prophylaxis

(1) Avoid walking barefoot in endemic areas [7].

(2) Wear shoes and protective clothing when working with soil or sand [7].

(3) Wash hands and feet after contact with soil [8].

(4) Regular hygiene, including keeping nails short and avoiding scratching [8].

(5) Use of repellents and bathing after exposure to sand or mud [9].

2. Community Prophylaxis

(1) Control of domestic animals: regular deworming with praziquantel, pyrantel, fenbendazole, or ivermectin [10].

(2) Sanitation: cleaning and covering sandboxes, soil cultivation [11].

(3) Education: information about risks and precautions [12].

3. Drug Prophylaxis

(1) At high risk: Ivermectin (200 μg/kg) or Albendazole (400 mg) once [13].

(2) If early infection is suspected: Topical thiabendazole 10% cream [14].

Medical Treatment

Treatment of CLM is aimed at killing the parasites, relieving symptoms, and preventing complications.

1. Antiparasitic Treatment

(1) Albendazole

a) Dose: 400 mg orally once or 400 mg daily for 3-7 days (in severe cases) [15].

b) Advantages: 85-100% efficacy, good tolerability [16].

c) Side Effects: Mild nausea, abdominal pain, rarely elevated liver enzymes [17].

d) Contraindicated in the first trimester of pregnancy [18].

(2) Ivermectin

a) Dose: 200 μg/kg orally once, repeated after 7 days if necessary [19].

b) Advantages: 98-100% efficacy, faster relief than albendazole [20].

c) Contraindicated in pregnant and lactating women

[21].

(3) Thiabendazole (Thiabendazole, Mintezol)

a) Topical therapy: 10-15% cream, 2-3 times daily for 5-10 days [22].

b) Side effects: Nausea, metallic taste, local – dermatitis [23].

2. Additional Treatment Approaches

(1) Cryotherapy: Used to freeze the larvae, but is not always effective [24].

(2) Symptomatic treatment: antihistamines – reduce itching [25]; corticosteroids (local, rarely systemic) – relieve inflammation [26]; antibacterial therapy – in case of secondary infection (local or systemic antibiotics) [27].

Prognosis

With proper treatment, symptoms of CLM usually resolve completely within a few days to a week. Without treatment, the infection may persist for weeks or months before the larvae die spontaneously [28].

4. Conclusion

The 61-year-old patient presented with a typical clinical picture of cutaneous larva migrans acquired after vacation in an endemic region (Zanzibar). The diagnosis was based on the history, characteristic serpiginous skin lesions, and histopathological findings. Laboratory studies showed moderate eosinophilia and elevated inflammatory markers (ESR and CRP). Systemic treatment with ivermectin resulted in rapid symptom relief and complete recovery. The present case highlights the importance of both early diagnosis, especially in patients who have traveled to endemic tropical and subtropical regions, and the need for timely treatment to prevent complications. Cutaneous larva migrans remains a health challenge in endemic areas. The disease rarely leads to serious complications, but can cause significant discomfort if therapy is delayed or improper. Educational initiatives, animal population control, and modern therapeutic options play a key role in reducing the incidence of infection, improving the prognosis and quality of life of affected patients.

Abbreviations

PBC Peripheral Blood Smear

Conflicts of Interest

The authors declare no conflicts of interest.

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