

Cutaneous Larva Migrans: A Case Report in a Traveler Child

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Volume 3 Issue 3- 2020

Received Date: 16 Feb 2020

Accepted Date: 10 Mar 2020

Published Date: 16 Mar 2020

2. Key words

Child; Cutaneous larva migrans;
Diagnosis; Therapy; Epidemiology

1. Abstract

Cutaneous Larva Migrans (CLM) is the most common skin disease of tropical origin caused by hookworm larvae, occurring in international travelers. Typical manifestations consist of erythematous, serpiginous slightly elevated linear cutaneous lesions. We describe the case of an 8-year-old boy, with CLM infection acquired during travel to Burkina-Faso, and successfully treated with Ivermectin. Epidemiology, clinical diagnosis and therapeutic are debated.

1.1. Background: Skin diseases are a common occurrence in international travellers and represent the third reason for seeking medical attention in returning travellers. As some skin diseases can have life-threatening complications, especially in children, it is important to discriminate whether the skin complaint represents a serious condition [1]. In these cases, history taking is very important and must include specific destination of travel and all possible exposures to insects and animals.

1.2. Case Presentation: An 8-year-old boy came to our pediatric Emergency Room because of a skin lesion on the median left foot (Figure 1a, 1b). Physical examination showed an erythematous, non-itching, slightly elevated both tortuous and linear lesion, extended for 3 cm. On the foot plant, there were some round crusted lesions. The lesion was noted 5 days after the return from travel to Burkina Faso. Traumas, insect bites or animal contacts were excluded. The boy had a normal chest and abdominal physical examination, no fever, no lymphadenomegaly, no neurological signs. Apart from the foot lesion, the skin examination was unremarkable. Complete blood count (CBC) showed marked eosinophilia (13.0% of WBC corresponding to 1296/ L). Treatment with an antihistamine agent was started and we referred the patient to the nearby Tropical Infectious Disease Center for further assessments, where the diagnosis of Cutaneous Larva Migrans (CML) was confirmed and he was prescribed oral ivermectin. A follow-up visit was planned in the outpatient clinic of our center; after 15 days the boy showed complete remission (Figure 1c) and a decreased eosinophils count (8.1% of WBC corresponding to 740/ μ L) was observed.

1.3. Discussion: CLM is the most common skin disease of tropical origin caused by hookworms, most commonly *Ancylostoma vermiforme*, *Ancylostoma caninum*, *Necator Americanus*, *Uncinaria stenocephala* and *Strongyloides stenocephala*. It is endemic in the Caribbean, Central and South America, Africa, Southeast Asia, and Australia. A temperature between 23°C and 30°C, the presence of humid soil, and proper aeration favor larval growth. The degree of contamination and the duration of contact with the soil also influence the occurrence of the disease. The adult worms

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<http://www.acmcase-report.com/>

Citation: Decembrino L, Cutaneous Larva Migrans: A Case Report in a Traveler Child. Annals of Clinical and Medical Case Reports. 2020; 3(3): 1-3.



Figure 1a: two points of entrance, marked by a round crusted lesion



Figure 1b: serpiginous tracks underneath the outer skin layer caused by the parasite



Figure 1c: the lesions after 15 days from the ER admission.

live in the intestine of dogs and cats and their eggs are shed through feces that contaminate the environment. Humans are accidental host where the parasite cannot complete its life cycle. The larvae penetrate the intact skin and travel in the epidermis, but are unable to cross the skin basal membrane and to develop into adults. Clinical manifestations mainly depend on environmental and behavioral factors such as walking barefoot in contaminated sand. The incubation period is generally of few days followed by the appearance of itching erythematous tunnels, which can be linear or tortuous. Creeping eruption usually appears 1–5 days after skin penetration, but the incubation period may be ≥ 1 month. In adults CLM can

rarely be bilateral or present as folliculitis or urticarial papules. The speed of migration depends on the parasite species, being usually of one centimeter per day. The numbers of larvae that can infect the area vary from one to hundreds (so there are also variations of the lesion topography). The infection is generally self-limiting, as the larvae cannot progress further in the human skin [2, 3].

CLM infection is observed in travelers returning from tropical locations and autochthonous cases are rare in Italy. The diagnosis is clinical and based on the detection of the typical skin lesions. The feet and buttocks are the more frequent localizations, but CLM can also infect the arms, hands, and trunk [4]. Face and scalp site CLM lesions are atypical and very rare, even if they were described in a 5 years boy [5]. The occurrence in infants is rare, due to their limited mobility, while children can be easier affected because they are used to walk barefoot on beaches while they were on vacation and sand is one of the most frequent high-risk environment for the infection acquisition [6]. CDC reported an outbreak of CML in a children's aquatic sports day camp in Florida involving 22 people. Erythema, pruritic rashes, serpiginous lesions, changing location rash or lesions were reported. Manifestations were noted on the buttocks, feet, legs, groin, and abdomen and 9 of the patients had lesions in more than one location [7].

In our case the child returned from a travel in an endemic region, the mother reported that the child has played barefoot on the sand and the high number of peripheral eosinophils on CBC was compatible with parasitic infection.

The diagnosis is based on history and clinical examination, biopsy is not recommended and laboratory exams, as peripheral hyper-eosinophilia, leucocytosis, hypergammaglobulinemia and positive serology, are useful to confirm diagnosis.

Differential diagnosis that should be considered are: Dirofilariasis, Fascioliasis, Gnathostomiasis, hookworm infection, Paragonimiasis, Pediatric Toxocariasis, Scabies, Strongyloidiasis, Visceral Larva Migrans [3]. A curious differential diagnosis is Pili migrans, a very rare condition that mimic CML infection, but it is due to a foreign body penetration in the skin, in their case hair [8].

Even if the disease is usually benign and can be self-limiting, complications may occur. Super-infection with *Staphylococcus Aureus* and/or *Streptococcus Pyogenes* has been reported, facilitated by scratching the area. This may cause edema making the parasite tunnels less visible. Moreover, allergic reactions to the parasite could worsen the erythema and the pruritus in the involved area [9]. The association of CML with Löffler's syndrome is particularly

rare in children. It can occur when there is a heavy infestation of larvae. Löffler's syndrome is characterized by migratory pulmonary infiltrates, peripheral eosinophilia, transient fever, cough and malaise [10]. This association with CLM was first reported by Wright and Gold in 1946. The exact pathogenesis remains unknown but now type I hypersensitivity reaction is the better hypothesis [10]. Even if complications associated to CLM are primarily local, the previously stated complications and intense pruritus may require systemic treatments for a longer time.

Treatment depends on the localization and on the extent of infection. Treatment by cryosurgery was routinely used prior to the availability of anthelmintics such as albendazole, mebendazole, thiabendazole and diethylcarbamazine [11]. The efficacy of liquid nitrogen alone is limited as larvae can be far from the erythema, while its combination with oral anti-helminths is more effective than albendazole treatment alone. Ivermectin is the treatment of choice, even if its safety has not been established in children weighing less than 15 kg. A single oral dose (200 microgram/kg body weight) is enough to kill the parasite effectively. When the treatment fails, a second dose could be administered. Generally, a single dose of ivermectin is more effective than albendazole (400 mg a day for 3 days). In case of Löffler's syndrome Albendazole 10–15 mg/kg/d for 3-5 days or longer seems to be the best treatment approach [10]. An alternative treatment with 10% topical thiabendazole ointment 4 times a day for at least 2 days is also reported in children. German guidelines suggest to apply albendazole 10% in a lipophilic base 3 times daily for 7-10 days in a large area as larvae can be far from the visible lesion [10]. Topical albendazole can be used in different concentrations (5 to 50%), and it is considered safe in children. Ivermectin cream 1% seems to be an ineffective treatment [11]. Antihistamine is used for the symptomatic treatment of pruritus.

Recently, Del Giudice et al [12] reported 5 cases of autochthonous CLM infection in France and they gave an overview of the autochthonous cases in Europe, giving advertisement to view of CLM not only as a typical and exclusive tropical diseases.

1. 4. Conclusions: In the era of modern medicine, it is important to be aware of CLM infection that, even if rare, can easily be acquired by international travelling children when playing on contaminated ground. Prevention by wearing slippers and clothes is important to avoid this infection along with policies for pets deworming. Even if prognosis is good, early recognition and treatment help in preventing complication. The surveillance of CLM infection, imported or autochthonous, can be helpful to monitor its incidence in Italy and Europe.

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