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An unusual presentation of cutaneous larva migrans mimicking Tinea manus treated with permethrin 5% topical: A case report

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Abstract

Cutaneous larva migrans (CLM) or so called creeping eruption is a skin infestation caused by percutaneous penetration of infectious larvae of *Ancylostoma braziliense*, *Ancylostoma caninum*, *Uncinaria stenocephala*, or *Bunostomum phlebotomum*. Typically presented as serpiginous or linear erythematous lesion, this case report describes an atypical presentation of CLM mimicking tinea manus. He was treated with antifungal but gave no response to it. Multiple dead helminth larvae was revealed by light microscope and histopathologic examination. Permethrin 5% topical was given as an alternative treatment and the symptoms resolved within 2 week. The patient admitted no side effects and was delighted to see the result.

Keywords: Cutaneous larva migrans, creeping eruption, atypical presentation, tinea manus, alternative therapy, permethrin

Introduction

Cutaneous larva migrans (CLM), also known as creeping eruption, is a parasitic infestation disease caused by the percutaneous penetration and epidermal migration of hookworm larvae in humans. CLM is the most common helminthic dermatosis. This parasitic infestation can be caused by species such as *Ancylostoma braziliense*, *Ancylostoma caninum*, *Uncinaria stenocephala*, or *Bunostomum phlebotomum*. CLM cases most frequently occur in tropical and subtropical regions, such as the Southeastern United States, the Caribbean, Africa, Central and South America, India, and Southeast Asia, including Indonesia^[1].

Parasitic infestation occurs when human skin comes into direct contact with soil or sand contaminated with hookworm larvae. Examples include people walking barefoot or farmworkers not wearing protective gloves. The larvae enter the epidermis (Usually in the *Stratum germinativum* and stratum corneum) and migrate a few centimeters per day. Most larvae are unable to penetrate deeper skin layers and will die within days to months^[2-4].

The typical skin efflorescence found in CLM cases is a single or multiple linear or serpiginous erythematous plaques about 3 mm wide and up to 15-20 cm long. Lesions usually appear within 1-5 days after exposure. The most common sites of CLM infestation are the upper and lower extremities. In rare cases, CLM can occur on the buttocks, genitalia, chest, and umbilical region^[5].

Skin lesions usually last for 2–8 weeks but can persist for up to 2 years. In rare cases (9–15% of cases), CLM lesions may present as vesicular, bullous, or papular lesions. A rarer clinical manifestation is hookworm folliculitis, characterized by clusters of 20–100 eosinophilic papules and pustules, often occurring on the buttocks. CLM patients may experience itching or even pain. Some may report wheezing, urticaria, and a dry cough, although these symptoms are uncommon. Excoriation and impetiginization are rare, occurring in only about 10% of cases^[2, 3, 5].

A definitive diagnosis is made through biopsy, which shows larvae trapped in the follicular canal, stratum corneum, or dermis with an inflammatory eosinophilic infiltrate. Microscopic examination of skin scrapings may also reveal living or dead larvae. Differential diagnoses for CLM include other parasitic infestations such as *Strongyloides stercoralis*, scabies, loiasis, myiasis, and schistosomiasis, as well as tinea corporis and contact dermatitis^[2, 3].

The principle of CLM management is to kill the hookworm larvae. Systemic therapy with Albendazole 400 mg for 3–7 consecutive days is the first-line treatment, except for children under 2 years old and pregnant or breastfeeding women. Thiabendazole 50 mg/kg/day for 2–4 days can be used as a second option and as the main treatment for children and pregnant or breastfeeding women. Ivermectin 200 µg/kg as a single dose may also be used as a third-line treatment. Topical therapy with Albendazole 10% or Thiabendazole 10–15% ointment can be applied 3 times a day for 7–10 days.

The prognosis for CLM is generally good, with self-resolution within 1–3 months. Secondary infections by *Staphylococcus aureus* or *Streptococci* can occur due to patient scratching. In rare cases, complications such as larval migration through the bloodstream to the lungs (Loeffler's syndrome) or small intestine (Eosinophilic enteritis) may occur [2, 3, 6].

Case Report

A 45-year-old male patient came to the dermatovenerology clinic at Soedjono General Hospital in Selong with complaints of itching accompanied by reddish rashes on the backs of both hands extending to the arms. The itching had been present for two weeks. Initially, the itching was only felt on the back of the hands, but then red lesions appeared, which gradually increased in size. The itching was very disruptive to the patient's daily activities. The patient had previously visited a doctor and was treated with antifungal medication, including 2% miconazole ointment and antihistamine tablets. While the itching slightly improved, the lesions continued to spread.

The patient works daily as a farm laborer harvesting water spinach without wearing gloves. He denied any previous history of similar complaints. He also denied similar complaints among family members living with him. There was no history of allergies, medication use, autoimmune diseases, or other comorbidities.



Fig 1: The patient's dermatological status at the initial visit: On the right (A) and left (B) backs of the hands, multiple annular erythematous plaques with well-defined borders and central clearing were observed (Resembling a dermatophyte infection).

On physical examination, the patient was alert (*Compos mentis*) and in generally normal condition. Dermatological status on the bilateral forearms (Antebrachii) and the backs of the hands (Dorsum manus) revealed multiple annular erythematous plaques with well-defined borders, 5–7 cm in diameter, with active edges and central clearing. The center of the lesions showed white pityriasis-like scales. Overall,

the dermatological status resembled a dermatophyte infection. There were no similar lesions on other parts of the body, such as the interdigital spaces, groin, feet, or buttocks. A 10% KOH skin scraping test was performed, but the result was negative for fungal infection. However, the KOH test revealed the presence of dead hookworm larvae. Based on this finding, a histopathological examination was conducted using a skin scraping specimen, which showed larvae trapped beneath the epidermis (Figure 2). Given the patient's complaints, risk factors, exposure history, unsuccessful treatment, and histopathological findings, a diagnosis of CLM (Cutaneous Larva Migrans) was established.

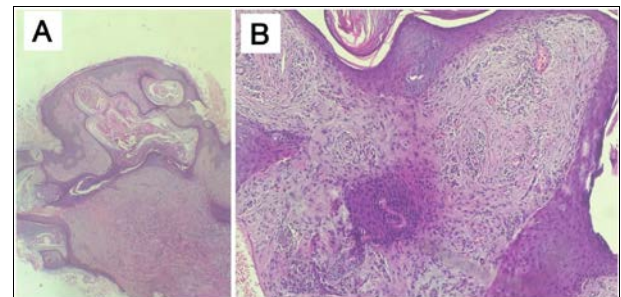


Fig 2: Histopathological examination results showing worm larvae trapped beneath the epidermis (A). At higher magnification (B), the larvae are visible within the epidermis, surrounded by eosinophil infiltration

After obtaining the patient's consent, treatment was initiated with 5% permethrin topical cream applied twice daily for two weeks after bathing. The patient was instructed to report any side effects and scheduled for a follow-up appointment in one week. After one week of treatment, the patient's symptoms had improved, and the lesions showed signs of healing. At the one-month follow-up (figure 3) after treatment, the lesions had healed, leaving post-inflammatory hyperpigmentation. The patient was advised to wear protective gloves and shoes while working and to avoid sitting directly on the ground without protection.



Fig 3: Follow-up one month after treatment. The lesions had healed, leaving post-inflammatory hyperpigmentation.

Discussion

Atypical presentations of CLM (Cutaneous Larva Migrans) have been increasingly reported in recent years. Several previous case reports have described atypical CLM presentations, including vesicobullous, eczematous, folliculitis, and pustular lesions [5–7]. Case reports of atypical clinical presentations of CLM are rarely documented in

Indonesia. One case report from the Department of Dermatology and Venereology at Dr. Hasan Sadikin General Hospital in Bandung described an atypical CLM case presenting with vesicobullous lesions and generalized serpiginous erythematous lesions^[8].

In this case, the patient presented with lesions resembling dermatophyte infections, characterized by multiple annular erythematous plaques with active borders and central clearing. This presentation differs from typical CLM (Cutaneous Larva Migrans), which usually manifests as linear or serpiginous erythematous plaques. However, the patient's condition did not improve with antifungal treatment. A 10% KOH examination revealed dead hookworm larvae instead of fungal growth. Histopathological examination ultimately confirmed the diagnosis of CLM in this case.

From the patient's history, the intense itching complaint was consistent with the common symptoms of CLM. The location of the parasitic infestation in this case matched CLM predilection sites, primarily affecting the extremities. The patient's occupation as a farmworker increased the risk of larvae entering through unprotected skin while working. Other risk factors included poor hygiene, limited access to clean water, and living in a CLM-endemic area^[9].

Differential diagnosis of contact dermatitis was excluded since the patient had no history of allergies or exposure to irritants, and no previous similar complaints were reported. The differential diagnosis of scabies was also excluded, as the patient did not report similar lesions in other areas such as the groin or interdigital spaces, no nocturnal pruritus was observed, and no family members had similar complaints at home.

The differential diagnosis for parasitic infestations causing creeping eruptions can be determined based on epidemiological data, exposure history, lesion characteristics (Location, number, width, length, and migration speed), the interval between exposure and onset, and symptom duration. Laboratory findings, such as eosinophilia, can also support the diagnosis^[2,3].

The most common causes of CLM, *A. braziliense* and *A. caninum*, typically produce 1–3 intensely itchy serpiginous erythematous plaques, with a predilection for the extremities and buttocks. *S. stercoralis* also causes serpiginous skin lesions, characterized by its rapid intradermal migration (Up to 5–10 cm per hour). The lesions usually disappear within a few hours but can recur over weeks to years. Loiasis (Infestation by *Loa loa*) can also produce serpiginous lesions, but these are caused by the migration of adult worms rather than larvae. Loiasis typically occurs beneath the epidermis or in the conjunctiva of the eyes. Gnathostomiasis (Infestation by *G. spinigerum*) is marked by its slow migration speed (About 1 cm per hour), with a predilection for the trunk. Gnathostomiasis can also cause migratory subcutaneous edema (Eosinophilic panniculitis), which can be single or multiple and itchy. Recurrences can occur in other parts of the body after an asymptomatic period^[3].

According to guidelines, the first-line treatment for CLM is albendazole 400 mg for 3–7 days. Alternatives include thiabendazole or ivermectin. Albendazole or thiabendazole ointments can also be used topically. However, not all healthcare facilities in Indonesia have these medications available. Permethrin, commonly used as an anti-pediculosis and anti-scabies treatment, with an elimination rate of 97–

99%, is a cheaper and more readily available alternative in Indonesia^[2,3].

Permethrin belongs to the pyrethroid class, which is one of the largest classes of insecticides. Pyrethroids are synthetic analogs of natural insecticidal esters chrysanthemum (Pyrethrin I) and pyrethic acid (Pyrethrin II), which are naturally found in *Chrysanthemum cinerifolius* flowers. The mechanism of action of this class of drugs is to induce damage to the central and peripheral nervous systems of the target^[1,10].

Permethrin causes the persistent opening of sodium channels in the target, leading to continuous axonal excitation and persistent impulse release due to sodium accumulation within the cell. This ultimately results in damage to the central and peripheral nervous systems, causing paralysis in the target parasite. Permethrin also leads to loss of control and consciousness in the target, eventually causing death^[1,10].

Conclusion

The publication of this atypical CLM case presentation is considered important to enhance the literacy and awareness of doctors in identifying similar cases. Accurate diagnosis can be missed due to atypical clinical presentations. It is hoped that this publication of an atypical CLM case will improve doctors' sensitivity to variations in the clinical presentation of CLM cases, enabling appropriate therapy for patients.

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Conflict of Interest

Not available

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Not available

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