

Cutaneous Larva Migrans Outbreak in Seeb Wilaya: A Case Series

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Abstract

Cutaneous larva migrans (CLM) is a parasitic skin infection caused by hookworm larvae mostly in tropical and subtropical regions. CLM is often misdiagnosed at the primary healthcare level. This case series aims to raise awareness among primary healthcare providers by describing nine cases of CLM at three PHCs in Seeb *wilayat* (Muscat) from December 2022 to May 2024. We demonstrate by these examples that CLM cases do occur in Oman and correctly diagnosed cases can be successfully treated with a short course of albendazole (100–400 mg daily for 3–5 days). We also recommend that clinician notify all cases to enrich the national database to launch targeted environmental control measures.

Keywords: Cutaneous Larva Migrans; Hookworm; Albendazole; Pruritus; Oman

Introduction

Cutaneous larva migrans (CLM) is a parasitic skin infection caused by hookworm larvae, particularly *Ancylostoma braziliense* and *Ancylostoma caninum*.^{1–3} CLM is endemic in many humid tropical and subtropical regions such as South and Southeast Asia; international travel and climate change may have contributed to wider spread.^{4,5}

The life cycle of the hookworm begins when adult worms lay eggs in the intestines of dogs and cats, which are then passed with their feces into the soil. Under favorable conditions in warm, moist soil, these eggs hatch, and within a week, the larvae mature into the infective form.⁶ Human infection typically occurs when their skin directly contacts the contaminated soil or sand, where the larvae penetrate through follicles, fissures, or even intact skin, of the feet, legs, buttocks, or back.⁷ Then, the larvae migrate within the epidermis, leading to marked pruritus with characteristic erythematous serpiginous tracks.⁸ Fortunately, these larvae are unable to complete their life cycle in the human body (accidental host), and die within weeks of their invasion.⁸

Several risk factors contribute to the acquisition of CLM—such as walking barefoot on contaminated soil, and residing in areas with many stray domestic animals like dogs and cats.⁶ Children, especially boys, are most frequently infected due to increased exposure to contaminated soil.⁹

Diagnosis is primarily clinical, based on the characteristic appearance of creeping eruption, and a history of exposure to contaminated soil or puddles. It is essential to distinguish CLM from other dermatological conditions with similar presentation.¹⁰ Dermoscopy can readily detect the larval body, appearing as an oval structure with a brown center and yellow border.¹¹

Despite being a self-limiting condition, where lesions typically resolve without treatment within 4–8 weeks,¹² CLM is often associated with severe itching that impacts the patient's daily life, and hence they seek medical attention. Yet, in non-endemic areas, the condition is often misdiagnosed and incorrectly treated.¹³ Topical thiabendazole is an effective initial therapy for localized infections.^{10,12} For multiple lesions or severe infestations, albendazole and ivermectin are considered first-line systemic therapies.¹⁰ Cryotherapy is ineffective and should be avoided.¹⁰

A total of 13 unrelated cases of CLM were diagnosed at Seeb Wilayat in Muscat region, in three different primary health centers. All the cases were clustered between December 2022 and May 2024, following a period of unusually severe hurricane and rainfall. However, due to refusal to consent, only nine cases will be presented in this series. These cases highlight the critical need for increased awareness and early recognition of CLM among healthcare providers, especially in regions where environmental conditions favor the transmission of this parasitic infection.

The Cases

Table 1 summarizes clinical details of nine typical CLM cases treated at our PHC. Seven occurred in children aged 2–9 years. In both boys and girls, lesions were mostly on the feet, though the hands and wrist were also affected. Presentations typically involved intensely itchy, erythematous, serpiginous tracts, frequently after barefoot exposure to beaches or contaminated soil. Symptoms lasted from one day to two weeks. Albendazole was the primary therapy, with some cases requiring antihistamines, topical agents, or antibiotics. Resolution was generally achieved within 3–7 days.

Two patients were men in their thirties. Their lesions involved the foot or forearm. Both had a clear history of soil exposure during outdoor activities. Both responded rapidly to short courses of albendazole without complications or need for specialist referral.

Table 1: Details of the nine cases of cutaneous larva migrans (CLM) reported from three urban primary healthcare centers at Seeb, Muscat.

	Date	Age/ Sex	Presentation	Site	Duration	Treatment	Rereferral to dermatology	Outcome
1	19/12/2022	7 y, male	Itchy, raised erythematous serpiginous lesion noted after playing in the beach. [Figure 1a]	Lateral dorsal aspect of the right foot	1 week	Albendazole 400 mg OD × 5 days	No	Significant improvement, minimal crusted patches remained. [Figure 1b]
2	5/1/2023	3 y, female	Erythematous, serpiginous lesions with marked itching and discomfort.	Distal right little finger and plantar left foot	1 day	Albendazole 200 mg BID × 5 days	Yes (parental request)	Lesions resolved completely post albendazole course; family canceled dermatology appointment.
3	8/1/2023	3 y, female (twin of case 2)	Severely itchy red serpiginous lesions.	Plantar aspect of both feet	Not documented	Albendazole 200 mg BID × 3 days, extended by 400mg OD × 5 days	No	Complete resolution within 5 days of completing course.
4	15/1/2023	36 y, male	Itchy, serpiginous, moving skin lesions following cavalry training in heavy clay soil. [Figure 2]	Lateral and posterior right foot	2 weeks	Albendazole 400 mg OD × 3 days	No	Complete resolution by day 3.
5	11/5/2023	9 y, male	Serpiginous, itchy erythematous skin lesions with scratch marks and skin peeling.	Both feet	Not documented	Albendazole 200 mg BID × 3 days extended to 5 days with 400mg OD	No	Complete resolution by day 5.
6	22/5/2023	2 y, male	Ill-defined erythematous serpiginous tract appeared initially in the left palm and then moved towards the index finger [Figure 3]	Left palm and index finger	1 week	Albendazole 100 mg OD × 3 days, extended to 5 days with 200mg OD + salicylic acid topical cream × 7 days	No	Complete resolution by day 5.
7	2/2/2024	5 y, male	Itchy, serpiginous skin lesion; history of walking barefoot on the beach. [Figure 4]	Right foot	2 weeks	Albendazole 120 mg BID × 3 days + chlorpheniramine × 3 days.	No	Not known as follow-up was not conducted.
8	24/5/2024	8 y, male	Itchy, serpiginous tract with sensation of movement under the skin and blister formation [Figure 5a]	Left wrist	3 days	Albendazole 400 mg OD × 3 days + amoxiclav + topical therapy.	Yes, seen in dermatology OPD and blisters were ruptured.	Resolved after dermatology consultation and topical therapy. [Figure 5b]

9	26/5/2024	34 y, male	Severely itchy lesion spreading downward leaving dry, hyper pigmented areas. [Figure 6a]	Left forearm	1 week	Albendazole 400 mg OD × 5 days.	No	Complete resolution by day 7. [Figure 6b]
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Note. *OD: once daily; BID: twice daily; OPD: outpatient department.*



Figure 1: (a) Worm-like appearance of a raised, erythematous lesion on the lateral dorsal right foot of a seven-year-old boy. (b): Significant improvement after seven days, leaving minimal crusted patches.



Figure 2: Male; 36 y. A serpiginous, raised skin lesion on the lateral side of the right foot, accompanied by some skin peeling.



Figure 3: Ill-defined serpiginous tract crossing the left index finger of a two-year-old boy.



Figure 4: An erythematous thread-like skin lesion on the sole of the right foot of a five-year-old boy.



Figure 5: Male; 8 y. (a) A serpiginous tract on the left wrist laterally with blisters and crusted brown skin patches at the previous sites. (b) Three days after rupturing the blisters, the lesion show improvement.

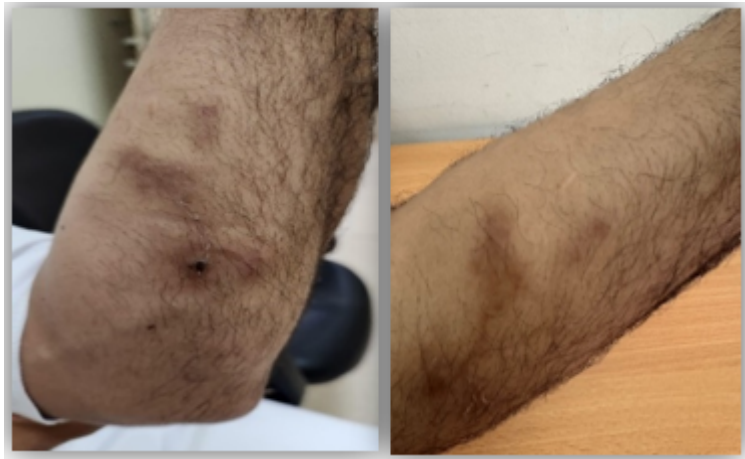


Figure 6: Male; 34 y. (a) Semi-circular, slightly raised lesion with erythema on the medial left forearm. (b) seven days post treatment: hyperpigmented patches remain on the same site.

Discussion

In this case series, we have presented nine cases of CLM reported during 2022–2024 in three PHCs in Seeb wilayat within the Governorate of Muscat [Table 1]. In Oman's hot desert climate, CLM cases are rare.¹⁴ Notably, this outbreak occurred after a period of unusually high rainfall in Oman, especially in the northern coastal regions, towards the end of 2022.¹⁵ In addition, Seeb is known for fishing, its beaches often contaminated by fish waste.

Across all our cases, the major presenting features were itchy worm-like skin lesions, mostly over the upper and lower limbs, noted most commonly among children. These findings align with the literature on typical CLM presentations and sites of involvement.^{11,16} However, atypical presentations may occur, such as in a previously reported case of severe skin eruption on the back.⁵

Seven out of our nine cases (78%) were young children, mostly boys, with all cases having lesions in upper and lower extremities. The two adult patients' nature of work involved frequent contact with soil: one was a farmer and the other served in cavalry, undergoing training in heavy clay soil.

CLM is diagnosed mainly clinically as it was with all the reported cases, as none required enzyme-linked immunosorbent assay or skin biopsy, as they are considered invasive and better if avoided.¹⁷ Although CLM is a self-limiting condition, healthcare providers typically prescribe antiparasitic drugs to eliminate the larvae and reduce the severity and duration of symptoms.¹² Oral albendazole is very effective with cure rates nearing 100%.¹⁰ Most of our patients' symptoms improved dramatically after a short course of oral albendazole (100–400 mg daily for five days) along with symptomatic treatment, except for one adult patient (case #4) where a three-day course was sufficient.

The Centers for Disease Control and Prevention (CDC) recommends albendazole 400 mg orally once a day for 3–7 days for adults and children aged > 2 years. For children under two years, topical agents are advised.¹⁸ However, we observed variability in dosing among general practitioners—with lower daily doses or divided doses totaling 400 mg per day.

Local complications were rare, with only one patient (Case #8) developing blisters requiring dermatology referral. He had been prescribed amoxiclav along with albendazole initially, suggesting a pre-existing or secondary bacterial infection. Literature has reported other local complications of CLM, such as persistent local skin allergies and non-resolving superadded skin infections like *Staphylococcus aureus* or *Streptococcus pyogenes*.¹⁹ Moreover, CLM infection may lead to systemic complications like Loeffler's syndrome.²⁰ None of our cases developed systemic complications.

All nine patients had a history of contact with water puddles or mud before the appearance of their symptoms. These and three more unreported cases occurred shortly after hurricanes and heavy rainfall. Personal communications with the local Department of Disease Surveillance and Control (August 10, 2024) and with the Oman Centre of Disease Control (August 19, 2024) revealed no prior reported cases of CLM in Muscat region. This could either be due to underdiagnoses of CLM, or a lack of a proper reporting system. Our findings underscore the need to raise awareness among primary healthcare providers and to establish mechanisms to report outbreaks of CLM in Oman, to enable the Ministry of Health to liaise with municipal and agricultural authorities for environmental control measures.

Conclusion

Our study highlights CLM as a condition that can present to PHC providers even in the clean and well-maintained urban environment of Muscat capital region. Early recognition and treatment with a short course of albendazole 400 mg once daily for five days is highly effective, with no need for further specialist referral. Continued medical education (CME) programs need to include this topic to strengthen general practitioners' competencies and to promote evidence-based medicine. Further, diagnosed cases need to be notified electronically to add to the national epidemiological statistics, and for policymakers to take appropriate multisectoral approach towards eradicating such parasitic infestations.

Disclosure

The authors declare no conflicts of interest. Informed consent was obtained from adult patients and parents of minors.

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