

Cutaneous Leishmaniasis After a Trip to Costa Rica

Hend Elsaghir, MD¹, Varun Sodhi, MD²

¹ Assistant Professor of Medicine, Division of Infectious Diseases, Department of Medicine University of Toledo

² Graduate of Infectious Diseases Fellowship Program, University of Toledo

Email: hend.elsaghir@utoledo.edu

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Abstract

We present a case of cutaneous leishmaniasis in a patient with chronic ulcerating skin lesions who recently traveled to Costa Rica. A 21-year-old male presented with a non-healing ulcer of six weeks duration on the right lower extremity. The patient was treated with multiple courses of antibiotics as empiric treatment for cellulitis with no response, and a decision was made to biopsy the lesion. The initial skin biopsy was negative for cultures and pathology. Due to high suspicion of *Leishmania*, a repeat biopsy was done, and the sample was sent to the US Centers for Disease Control and Prevention for further evaluation; it was positive for *Leishmania* spp. Though treatment of *Leishmania* varies depending on the species, the patient was treated with miltefosine due to the prevalence of *Leishmania guyanensis* in Costa Rica. The patient had an appropriate response with good wound healing after eight weeks of therapy and wound care.

Keywords: Leishmaniasis, Miltefosine, Chronic skin ulcer

1. Introduction

Chronic skin lesions are less likely to be bacterial in nature and more likely to be fungal, mycobacterial, parasitic, or malignant. A detailed history including sexual, travel, and social is a key for provisional diagnosis, and a biopsy usually establishes the diagnosis. *Leishmania* amastigotes are easy to visualize on hematoxylin and eosin (H&E) stain in the early stage, but they are difficult to visualize in the later stage due to the resolving granulomatous and sclerotic inflammatory patterns [1].

Leishmaniasis, one of the neglected tropical parasitic diseases, is found in parts of the tropics and subtropics. Leishmaniasis is classified geographically into the Old World (Eastern Hemisphere) and New World (Western Hemisphere) types [2]. At least 21 species have been implicated in human disease, and all share female sandfly vectors (i.e., Old World, genus *Phlebotomus*; New World, genus *Lutzomyia*). Cutaneous leishmaniasis (CL), mucosal leishmaniasis (ML), and visceral leishmaniasis (VL) are the three major clinical types encountered and have different treatments and outcomes. CL typically occurs at skin-exposed areas at the bite site of the sand fly. It presents with a papule that progresses to a painless non-healing skin ulcer and usually responds to local wound care. ML happens when the amastigotes disseminate through the hematogenous and lymphatic system to the nasopharyngeal area, causing ulceration and disfigurement to the nasopharyngeal area if not treated. VL, also known as kala-azar or black fever, is the most severe form and causes systemic infection. It affects multiple organs, including the liver and spleen, via hematogenous spread. VL is an opportunistic infection in patients with human immunodeficiency virus (HIV) [4].

2. Case Report

A 21-year-old male with no past medical history presented to the clinic with six weeks of a non-healing ulcer on the right lower extremity. The ulcer was progressively worsening and non-tender without any drainage. The patient traveled to Costa Rica about 10 weeks ago where he spent 10 days on vacation and went hiking while there. He does not remember any trauma or insect bites. The patient denies any fever, chills, cough, weight loss, night sweats, loss of appetite, or any other symptoms. On a physical exam, there was a scabbed ulcer on the posterior side of the right leg

close to the calf. The ulcer was about 4 x 3 cm without any surrounding erythema or drainage and was non-tender. Subcutaneous nodules were also seen proximal to the ulcer, giving the appearance of lymphangitic spread in a sporotrichoid pattern (Fig. 1).

The patient was given cephalexin with no significant improvement and then was given trimethoprim/sulfamethoxazole, also with no significant improvement. A skin punch biopsy for pathology and bacterial, fungal, and acid-fast bacilli cultures was done, which were all negative. Due to high suspicion for *Leishmania*, biopsy specimens were sent to the US Centers for Disease Control and Prevention (CDC) for further evaluation of the infectious etiology. On immunohistochemistry, amastigotes were seen as two red spots (Fig. 2). DNA sequencing of polymerase chain reaction (PCR) amplicons was positive for *Leishmania* spp. (Fig. 2).

Exact species were not identified, but Costa Rica is one of the endemic regions for *Leishmania guyanensis* and *Leishmania panamensis*, so there was risk of ML [4]. The patient had complex CL involving subcutaneous nodules, and his ulcer wound did not respond to local wound care, so the decision was to treat with systemic agents per Infectious Disease of America (IDSA) guidelines [4]. The patient was started on 50 mg of miltefosine every eight hours for 28 days and was referred to the wound care center. Miltefosine was preferred for parenteral options since it was oral and Food and Drug Administration (FDA)-approved [6]. The patient followed up at four weeks post-treatment and still had skin lesions. The lesions seemed to worsen, and the patient was concerned about disfigurement. Miltefosine was continued at the same regimen for an additional 28 days, and the patient had an appropriate response with excellent wound healing at the end of the treatment (Figs. 3 and 4).

3. Discussion

Leishmaniasis is found in approximately 90 countries, but only eight countries contribute to 90% of cases: Afghanistan, Algeria, Brazil, Iran, Pakistan, Peru, Saudi Arabia, and Syria [3]. For CL, the estimated number of new cases is between 700,000 to 1.2 million cases per year [2].

CL is divided into simple and complex disease. Simple disease is defined by 1) four or fewer lesions (1 cm or more), 2) no lesion in a cosmetically sensitive area, 3) no lesions over genitals or joints, and 4) immunocompetent host.

Complex disease is defined by 1) >4 lesions, 2) one lesion >5 cm, 3) lesion in a cosmetically sensitive area, 4) lesions over genitals or joints, 5) large regional lymphadenopathy, 6) lymphatic nodules, 7) failure of previous treatment, or 8) immunocompromised host [4].

Histopathological findings of CL vary. The epidermis may be either ulcerated with marked secondary changes and epidermal reaction, or alternatively, the epidermis may be unremarkable and overlying a dense dermal infiltrate that contains plasma cells and histiocytes. The amastigotes are easy to visualize on H&E stain during the earlier stages, but resolving granulomatous and sclerotic inflammatory patterns make them difficult to find during the late stages [1].

Various laboratory methods can be used to diagnose *Leishmania* spp., which include cultures, molecular methods, and examination of parasites under a microscope. Full-thickness skin biopsy of the ulcer edge is recommended by IDSA to allow for simultaneous testing for other diagnoses, such as histopathology and culture. Sample should be obtained from a clean lesion after removal of eschar and/or exudate [4].

DNA-based assay should be performed, especially if other diagnostic testing is negative, due to its high sensitivity and specificity [5]. Serological testing is not recommended in the diagnosis of CL as the currently available tests are neither sensitive nor specific. In patients with high suspicion of CL with negative diagnostic testing, treatment may be indicated based on an individualized risk-benefit assessment [4].

The treatment of CL varies from patient to patient, and not all CL needs to be treated. Mild CL can be observed for spontaneous healing. If observation fails, local therapy with paromomycin ointment, intralesional meglumine antimoniate, cryotherapy, or laser therapy can be done. If *Leishmania braziliensis* is isolated, it is treated with systemic agents due to the high risk of disseminated CL [4].

If complex CL is present, the parenteral options available in North America include conventional and liposomal amphotericin B, pentavalent antimonial compounds, and pentamidine. Oral options include miltefosine, ketoconazole, or fluconazole. Of them, only miltefosine is approved by the FDA, although it is not commercially available in most European countries [6].

No universally applicable therapy is available for CL. It is based on individual risk factors, and

different species are treated with different drugs. The choice of agent, dose, and duration varies due to different responses in different individuals. The factors that are usually considered in selecting a drug include age, pregnancy, obesity, and hepatic, pancreatic, renal, or cardiac comorbidities [3]. In our patient, miltefosine was preferred as an FDA-approved oral agent with minimal adverse effects.

The response to the therapy is assessed clinically, and repeating the parasitology testing is not recommended [4]. The ulcer usually continues to heal for months after finishing the therapy. The expected healing of the ulcer after 4-6 weeks is more than 50%. Therapeutic failure, which includes relatively little or no improvement and worsening while on therapy, is assessed clinically. A paradoxical increase in the local inflammatory response can be seen 2-3 weeks after starting the therapy, making it difficult to differentiate from the therapeutic failure. Additional therapy is recommended if the patient has worsening of the existing lesion [4], as was the case in this patient. Management should include wound care, documentation of lesion evolution, and patient education regarding treatment failure and relapses.

4. Conclusion

Leishmaniasis is a neglected tropical disease with more than 12 million people infected. CL and VL are present in 21 countries. CL is endemic in 19 countries, while VL is endemic in 13 countries. Patients with CL present with chronic nonhealing ulcers, initially treated with different classes of antimicrobials with failure. Travel history is a key component in history taking, and leishmaniasis should be high on the differential in a returning traveler with non-healing ulcers. The diagnosis is usually made by skin biopsy of the ulcer's edge, but it can be falsely negative depending on the early versus late stage of the presentation. If the biopsy results are negative but the clinical suspicion is high, repeat biopsy or empiric treatment can also be initiated after discussion with the patient as the medications do have significant side effects.

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