Larva Currens in a Patient Scheduled for Renal Transplant

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GOAL

To understand larva currens to better manage patients with the condition

OBJECTIVES

Upon completion of this activity, dermatologists and general practitioners should be able to:

1. Discuss symptoms of strongyloidiasis.
2. Describe the presentation of disseminated disease in immunocompromised patients.
3. Identify treatment options for larva currens.

CME Test on page 427.

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We present a case of larva currens in a patient scheduled for renal transplant. Larva currens is an eruption caused by Strongyloides stercoralis, *characterized most often by a pathognomonic, migratory, rapidly extending, serpiginous, urticarial eruption. Infected patients who are immunocompromised are at risk for disseminated and often fatal infection. In disseminated disease, diffuse petechiae and purpura may be present, and periumbilical ecchymoses may resemble thumbprints. The dermatologist may be in a unique position to diagnose this condition and institute therapy. Although found endemically in the United States, the increasingly international nature of medical practice and transplantation medicine causes an increase in the number of patients who may present for evaluation.*

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Case Report

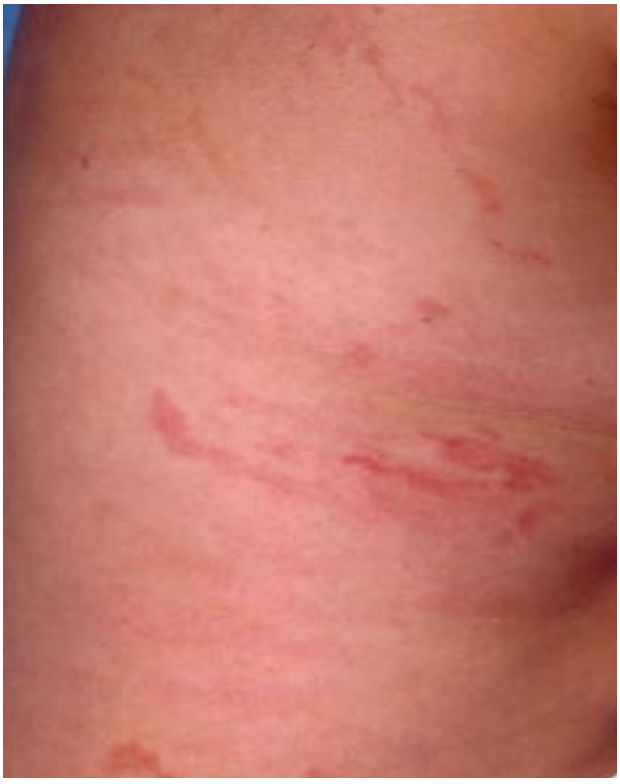
A 54-year-old woman with polycystic disease of kidneys was scheduled for renal transplant and presented with a 2-week history of an extremely pruritic rash that primarily affected her torso, buttocks, shoulders,

and thighs. She described the lesions as red, raised, and linear, typically lasting less than 24 hours at a time. She had been previously treated with a 5-day course of prednisone by another physician, without improvement. Her only new medication was glucosamine and chondroitin sulfate, which she had started one week prior to the eruption. Raloxifene hydrochloride and cetirizine hydrochloride were long-term medications.

The patient reported one similar episode many years ago. She denied any recent changes in her health and reported no gastrointestinal tract or pulmonary symptoms. She was raised in Panama and had visited there in the past year. She specifically denied walking without shoes.

On physical examination, the patient had a pink, serpiginous, urticarial plaque on the right side of the trunk that was surrounded by a few red serpiginous patches (Figure). Her white blood cell count was $6.5\times10^3/\mu L$ (reference range, 3.5–$10.5\times10^3/\mu L$), with 19.2% eosinophils (reference, 2.7%). Her absolute eosinophil count was elevated at 1200/μL (reference range, 0–450/μL). A review of prior laboratory test results indicated that her absolute eosinophil count also had been elevated 6 months prior to presentation. Serologic evaluation by enzyme-linked immunosorbent assay was positive for *Strongyloides*. Results of stool studies did not reveal ova and parasites.

The patient was treated with oral thiabendazole 1500 mg twice daily for 2 days and her transplant was postponed. Her rash resolved, but 2 weeks later, her white blood cell count was $5.6\times10^3/\mu L$, with 11.6% eosinophils. She was subsequently treated with a single dose of 200 μg/kg of ivermectin. Results of a complete blood count obtained 2 weeks later demonstrated that her eosinophil count was within reference range and she was able to proceed with the transplant. The patient's sister (the donor) also was born in Panama and had negative serologic evaluation results for *Strongyloides*. The patient did well following the transplant and the results of repeat serologic evaluations performed 4 months after the transplant were negative for *Strongyloides*.



Larva currens affecting the trunk.

Comment

Strongyloides stercoralis is an intestinal nematode primarily found in tropical or subtropical countries. Humans are infected by filariform larvae that dwell in the soil. Larvae penetrate intact skin, gain access to the venous system, pass through the heart to the lungs, enter the pulmonary alveoli, migrate up the tracheobronchial tree, and are swallowed, thereby entering the gastrointestinal tract.[1] The larvae mature into adult females that penetrate the mucosa of the small intestine and deposit eggs. The eggs hatch into rhabditiform larvae that are passed in the stool to the soil where transformation into the infective form (filariform) occurs. Autoinfection may take place when this transformation to the infective-stage larvae occurs within the gastrointestinal tract, enabling the infective larvae to invade the lower large bowel or perianal skin and begin the migratory pathway. Autoinfection can allow the persistence of infection for long periods of time and also can allow chronic infections to persist in climates where free-living larvae cannot survive.[2]

Uncomplicated infection with *S stercoralis* can cause cutaneous, gastrointestinal tract, and pulmonary symptoms corresponding to the involvement of organs during the parasite's life cycle. Rash is uncommon in acute infection, though it is common in chronic disease. Maculopapular eruptions and chronic urticaria have been reported in up to two-thirds of patients.[3] Larva currens is a migratory, rapidly extending, serpiginous, urticarial lesion that is pathognomonic for chronic strongyloidiasis. The rash typically lasts from several hours to several days. It most commonly affects the buttocks, perineum, and thighs, and is secondary to invasion of perianal skin by filariform larvae from the patient's intestine. Arthur and Shelley[4] proposed the term *larva currens* (running larva) because the larvae and subsequent rash can move up to 10 cm per hour.

In a healthy host, the cellular immune system seems to limit parasite invasion of mucosal tissues.[5] If immunosuppression occurs, individuals with strongyloidiasis can develop a hyperinfective syndrome and massive numbers of larvae can invade any organ of the body, with a mortality rate of 70% to 90%.[6,7] The cutaneous manifestation of disseminated strongyloidiasis is the rapid onset of a petechial and purpuric eruption that typically involves the proximal extremities and trunk and results from massive invasion of the skin by filariform larvae. The "thumbprint sign" refers to a pattern of periumbilical ecchymoses resembling multiple thumbprints that can occur in hyperinfection.[8]

Gastrointestinal tract symptoms predominate in acute infection. Diarrhea and midepigastric pain that may mimic peptic ulcer disease are common. Diarrhea also can alternate with constipation. Other gastrointestinal tract symptoms include nausea, vomiting, anorexia, pruritus ani, and bloating.[1] Some severe cases can have malabsorption and evidence of a protein-losing enteropathy.[9,10]

Pulmonary symptoms in acute infection can occur and include wheezing, coughing, and shortness of breath.[1] Larval migration through the lungs also can lead to transient pulmonary infiltrates. Some patients have presented with asthma.[11] Patients with chronic disease may have gastrointestinal tract and pulmonary symptoms, though chronic infection tends to be indolent and patients may be asymptomatic.

Diagnosis can be difficult, as results from stool samples often are negative and multiple samples may be required. Results of biopsies performed on larva currens specimens usually do not reveal larvae, though biopsy results of the petechial and purpuric eruptions of disseminated disease will reveal larvae. Serologic testing with enzyme-linked immunosorbent assay has a sensitivity of approximately 90%.[12,13]

Traditionally, thiabendazole has been used to treat this infection, though in approximately 30% of cases, the parasite is not eradicated from the feces. Ivermectin has been found to be more effective for treating uncomplicated chronic disease.[14]

In most cases of disseminated disease, patients were receiving corticosteroids or other immunosuppressive drugs or had an underlying illness, such as malignancy or AIDS.[1,2,15,16] Our patient was scheduled to undergo a renal transplant and fatal disseminated strongyloidiasis has been reported in patients undergoing renal transplant.[2,16] Morgan et al[2] reviewed 29 cases of strongyloidiasis complicating renal transplants; 15 patients died.

Infection in the immunocompromised patient can be complicated by the fact that invasive larvae can transport gram-negative bacilli from the intestine to sites of migration, such as the pulmonary and central nervous systems.[5] Gram-negative sepsis, meningitis, or pneumonia can result. Diagnosis can be difficult because eosinophilia often is absent in immunocompromised patients with disseminated disease.[5]

Although common in tropical and subtropical countries, other geographic regions of endemic *Strongyloides* are recognized. The climate and soil of the southeastern United States favor the survival of the organism,[5] and the parasite was reported in 3% (N=561) of a group of rural Kentucky schoolchildren[17]; similar findings were reported in another study conducted in Kentucky.[18] *Strongyloides* also was the most commonly detected parasite in a review of stool samples examined at the University of Kentucky Medical Center.[19] Ex–prisoners of war who served in Southeast Asia during World War II also constitute an at-risk group in the United States.[20-22]

It is imperative to rule out the presence of this parasite prior to transplant in patients with a geographic history predisposing them to infection, a history of eosinophilia, or symptoms of chronic strongyloidiasis.[1] Many transplantation centers routinely screen for this parasite as part of the pretransplant evaluation. Although uncommon in acute infections, cutaneous involvement often is present in chronic strongyloidiasis.[1] It also is important to follow patients already treated for larva currens closely posttransplant, as therapeutic failures occur.

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