Strongyloides Stercoralis Infection Presenting With Severe Malabsorption And Arthritis In An Immune Competent Host

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Citation

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Abstract

We describe a 69-year-old woman without evidence of immunosuppression who developed a severe malabsorption syndrome associated with Strongyloides stercoralis infection. She went on to develop a severe arthritis of the ankle even after successful eradication of the parasite. Resection of the ankle mass revealed a cartilaginous loose body with degenerative calcification, ossification and cystic degeneration. This case is unusual because of the severity of clinical symptoms, the extent of histological damage to the duodenal mucosa and the development of arthritis after eradication of the parasite. Strongyloidiasis should be considered in the differential diagnosis of severe malabsorption and acute arthritis.

INTRODUCTION

Strongyloides stercoralis is a widespread, soil-transmitted intestinal nematode affecting 100 million people in 70 countries, most commonly in tropical and subtropical areas and in the southeastern US [1,2]. Human infection occurs when filariform larvae penetrate the intact skin and enter the venous microcirculation via the lymphatics. The organism then travels to the lung, penetrates the alveoli and moves up the bronchus, where it is swallowed down the esophagus to the intestine.

In the duodenum and upper jejunum, the larvae mature into adult females that produce eggs, which are shed in the stool as rhabditiform larvae. While most rhabditiform larvae are excreted, some return to being filariform larvae and begin an autoinfective cycle by penetrating colonic mucosa or peri-anal skin leading to chronic infection [2]. In half of all cases, chronically infected individuals are asymptomatic. Typical symptoms include epigastric pain, diarrhea, nausea, vomiting, constipation and weight loss. Gastrointestinal and pulmonary symptoms can considerably worsen with the hyperinfection syndrome, where the parasite burden increases due to a rapid autoinfective cycle without widespread dissemination [2] In the immunosuppressed host, severe infection can occur in which the filariform larvae disseminate widely, leading to fatal sepsis, meningitis and ARDS [2,3,4,5].

Many cases of S. stercoralis have been reported following endoscopic diagnosis of intestinal invasion [6,7]. Most of these cases are mild and resolve uneventfully after antihelminthic treatment. Here, we report a case of severe S. stercoralis malabsorption syndrome in a patient without evidence of immunosuppression. Treatment with antihelminthic agents appeared to result in clinical and endoscopic resolution. However, the patient later presented with arthritic symptoms. Although arthritis has been described in association with S. stercoralis, the literature reports resolution of the arthritis with elimination of the parasite [6, 8,9,10,11,12, 14, 23]. Our case is unusual because of the severe symptoms and possible dissemination to joints in an immune competent host. The development of arthritis after initial clinical response to antihelminthic therapy raises questions about the etiology of the arthritis.

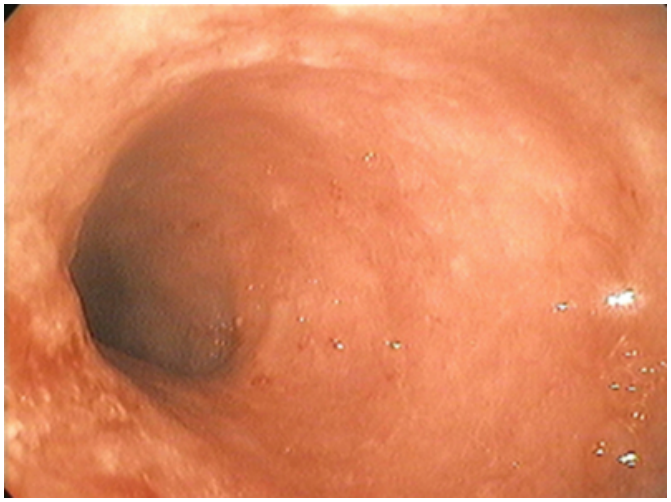
CASE REPORT

This 69-year-old woman, originally from the Dominican Republic, had lived continuously in New York City for over 10 years. She presented to our institution with a one-month history of diarrhea, headache, crampy abdominal pain, fever, chills, dizziness, weakness and nausea. She described the diarrhea as always occurring post-prandially and usually twenty times per day and at night. She had lost twenty pounds over the past month. She denied recent travel but lived in poor, unhygienic conditions. Her dog, which had been ill with diarrhea for weeks, died shortly after she became ill. Her history was significant for arthritic back pain and GERD. She was taking loperamide and ranitidine with

little symptomatic benefit. Her physical exam was significant for a diffusely tender upper abdomen. Hematological abnormalities included eosinophils of 7.6% (laboratory normal 0 to 5%). Laboratory abnormalities included borderline hyponatremia and hypokalemia. Endoscopy was significant for complete loss of duodenal folds with inflammation and marked erythema (Figure 1).

Figure 1

Figure 1: Endoscopic images of the second portion of the duodenum showing complete loss of duodenal folds with inflammation and marked erythema.

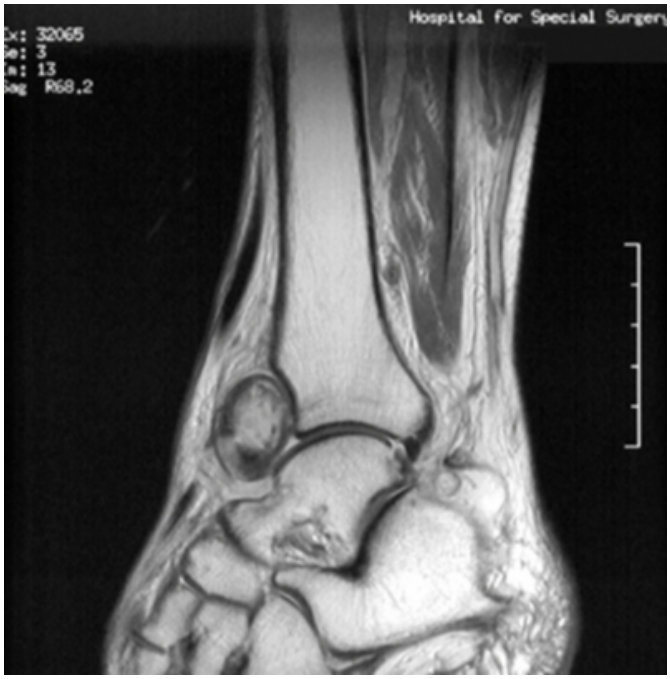


Biopsy showed parasitic ulcerative duodenitis consistent with S. stercoralis infestation. Numerous organisms were present. After 10 days treatment with thiabendazole, 500 mg orally twice a day, the diarrhea ceased and she started to gain weight.

However, a month after treatment, she presented with pain, swelling and hyperpigmentation in her right ankle and thumb. An MRI of the right ankle showed diffuse inflammation consistent with synovitis with erosion and a debris-filled soft tissue mass at the anterior margin of the ankle joint, suggesting possible metastatic parasitic infection (Figure 2).

Figure 2

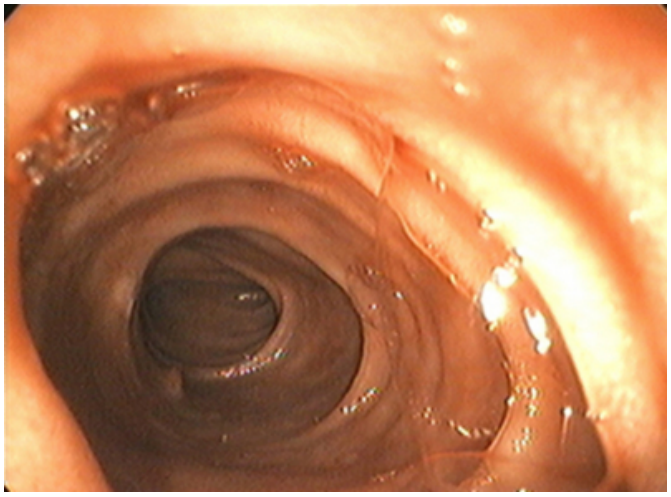
Figure 2: MRI of the right ankle showing diffuse inflammation consistent with synovitis with erosion and a debris-filled soft tissue mass at the anterior margin of the ankle joint, suggesting possible metastatic parasitic infection.



Strongyloidiasis due to immunosuppression was suspected. However, she had never received corticosteroids or other immunosuppressive therapy and HTLV1 and HTLV2 were negative. A CT of the abdomen was unremarkable. Repeat endoscopy showed some return of folds to a previously atrophic duodenum (Figure 3) and biopsy showed fragments of degenerated and necrotic parasitic forms but no parasites.

Figure 3

Figure 3: Follow-up endoscopy four months later after treatment with thiabendazole showing significant return of folds and resolution of inflammation and erythema.



Resection of the right ankle mass revealed a cystic, opalescent, smooth surfaced, pearly white rubbery mass with an irregular and semi-gelatinous inner surface. Pathology revealed a cartilaginous, loose body that had undergone degenerative calcification, secondary ossification and a central cystic degeneration. No foreign bodies or parasites were detected. Repeat lab results showed normal eosinophils, negative echinococcus and negative stools for ova and parasites.

DISCUSSION

This report describes a patient with S. stercoralis infection who presented with severe intestinal symptoms that appeared to be successfully treated, but progressed later to arthritis involving several joints.

Although the literature is replete with examples of severe malabsorption syndromes due to S. stercoralis in patients on corticosteroids, with diabetes and with HTLV-1 [5,6,7, 16,17,18], this patient's severe malabsorption syndrome is unusual in that she had no prior history of corticosteroid use and had no history or signs of immunosuppression. Her only predisposing factors for hyperinfection included her recent use of loperamide, which by slowing intestinal transit could impair clearance of the parasite. Hypochlorhydria, resulting from ranitidine use [2] might be another contributory factor. In patients infected with Strongyloides, abdominal symptoms are uncommon in the absence of immunosuppressive medications or illness [7].

The source of our patient's infection is not clear. She may have acquired the infection acutely from her ill dog. A study from Chile recently described larvae migrans in up to 12.5 percent of dog feces from public parks [19].

Compared to protozoa, helminths such as S. stercoralis are more frequently associated with musculoskeletal involvement. This may be due to their greater antigen complexity and invasiveness [20]. The mechanism underlying the arthritis associated with S. stercoralis infection in our patient is unclear. One possibility suggested by her MRI scan is direct invasion of her joints. This is a rare event. Indeed, only one case of S. stercoralis associated arthritis reported actual presence of the organism in the joint [12]. An alternative mechanism might be ascribed to a reactive arthritis [12, 14, 21]. Evidence in support of this includes high synovial and serum immune complex levels and deposition of IgG and C3 in the synovium [11, 14]. Several possible explanations for a reactive arthritis have been suggested. Strongyloides carry enteric bacteria during the invasive stage [13]. Cross-reactive antibodies directed against these bacteria could potentially elicit a delayed reactive arthritis [14]. Another hypothesis involves filarial parasites whose endosymbiotic bacteria, Wolbachia, are released upon parasite death and can also lead to acute inflammatory disease. The acute manifestation is known as the Mazzotti reaction [20, 22]. A few hours after receiving an anti-helminthic, patients can develop joint pain, skin rashes, fever, acute lymphadenopathy, tachycardia and hypotension. Days later, polyarthritis of the large and small joints develops along with muscle pain and fever. It is conceivable that Strongyloides might carry a similar endosymbiotic bacterium, which might elicit a reactive arthritis even after successful treatment of the parasite.

The relationship between host immune status, intestinal symptoms resulting from Strongyloidiasis and arthritis is unclear [6, 8,9,10,11,12, 15, 18, 23,24,25, 27]. T helper 2 cells (Th2) are associated with humoral immunity and allergic responses [22, 26,27] and are the main immune response to helminths. The Th2 cytokine IL4 stimulates the production of IgE, which on contact with parasite antigens, stimulates mast cell degranulation and goblet cell mucus secretion [2]. The stimulation of gut motility and the release of mucus inhibit worm attachment and invasion. Immune suppression with corticosteroids and with etanercept, an anti-TNF alpha monoclonal antibody, have been associated with unmasking Strongyloides infection and fulminant infections have been described [6, 18, 25, 27]. However, there was no evidence that

immune suppression played a role in the clinical course of the infection in our patient.

In summary, we report an unusually severe case of malabsorption syndrome associated with of S. stercoralis in a 69 year old woman. After successful eradication of the parasite, she developed arthritis in her ankle and small joints. The case is unusual because of the severity of the clinical symptoms and the extent of the histological damage to the duodenal mucosa. It is also noteworthy that the arthritis developed after successful eradication of the parasite.

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