



A Rare Cause of Diarrhea: Intestinal Spirochetosis in an HIV-Positive Patient

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ABSTRACT

Intestinal spirochetosis (IS) is a rare gastrointestinal infection with vague presenting symptoms. Diagnosis is confirmed histopathologically. Risk factors include homosexuality and HIV. Antibiotic treatment with metronidazole usually leads to resolution of symptoms. We present the case of a 56-year-old HIV-positive man with chronic, watery diarrhea who was diagnosed with IS. This case highlights the importance of considering IS in the differential in HIV-positive patients with nonspecific gastrointestinal symptoms after more common etiologies have been ruled out.

KEYWORDS: intestinal spirochetosis; HIV; diarrhea

INTRODUCTION

Intestinal spirochetosis (IS) is a rare infection defined by the histologic presence of spirochetal organisms adhering to the colorectal epithelium. The most commonly implicated organisms in humans are *Brachyspira aalborgi* and *Brachyspira pilosicoli*.¹ Histopathologic specimens characteristically show a thickened fringe or “false brush border” because of spirochetal colonization of the colorectal mucosa and colonic eosinophilia.² The route of transmission is believed to be oral-anal contact with some postulations that it may be sexually transmitted. There is a higher prevalence of IS in men who have sex with men and HIV-infected patients in developed countries.³ The prevalence of IS in the general population has been estimated to be around 2%.² Most cases are found incidentally in asymptomatic patients; however, the most common symptoms associated with IS colonization are diarrhea, abdominal pain, and bloating. Invasion beyond the surface epithelium is associated with symptomatic IS. Treatment with antimicrobials such as metronidazole is effective for symptom remission.

CASE REPORTS

We report the case of a 56-year-old man with HIV who presented with 3–4 episodes of diarrhea daily for 4 months without associated mucous or blood. He denied abdominal pain, nausea, vomiting, weight loss, or recent antibiotic use. Physical examination was unremarkable. Screening colonoscopy 2 years ago was unremarkable. He has regular follow-up in infectious disease clinic and is on antiretroviral therapy with a normal CD4 count. Tissue transglutaminase antibody was negative, and total IgA level was normal. Rapid plasma reagin was nonreactive.

Afterward, a colonoscopy was performed and revealed normal colonic mucosa without evidence of inflammation or ulceration in the terminal ileum, colon, and rectum (Figure 1). Biopsies were taken throughout the colon to evaluate for microscopic colitis. Histopathology (hematoxylin and eosin and Warthin-Starry stains) demonstrated colonic epithelium with spirochetal organisms and a false brush border, confirming a diagnosis of IS (Figure 2). The patient was treated with a 10-day course of metronidazole with resolution of diarrhea.

DISCUSSION

IS is an unusual cause of chronic diarrhea, primarily affecting homosexual and HIV-positive individuals in developed nations. Although believed to be more common in the developing world, limited incidence data exist for other subpopulations potentially at risk including the immunocompromised and those practicing other high-risk sexual behaviors. The route of transmission is believed to be oral-anal contact.



Figure 1. Colonoscopy imaging demonstrating normal colonic mucosa.

Spirochetal colonization of the colorectal epithelium is believed to be part of the normal microbiome in some individuals because most cases are asymptomatic and incidentally discovered.⁴ However, the most frequently reported symptoms include abdominal pain, bloating, and watery diarrhea. Specific data linking CD4 count levels to the symptomatology or severity of IS in HIV-positive patients are limited. It is proposed that invasion beyond the surface epithelium is associated with the development of symptoms. Spirochetes stimulate changes in the colorectal epithelium causing blunting, loss of microvilli, mitochondrial swelling, and cell membrane destruction with resultant diarrhea hypothesized to be due to decreased resorptive brush border function.⁴ The quantity of cellular destruction and severity of diarrhea typically parallel the degree of cellular invasion. In rare cases, disseminated spirochetemia has been reported.⁵

Diagnosis heavily relies on histopathologic examination of colonic biopsies. Specimens characteristically depict a thickened, filamentous brush border because of the coating of spirochetes on the apical cell membrane of the colonic epithelium. Confirmation for IS can be performed by Warthin-Starry (silver) stain or by immunostaining for *Treponema pallidum*, which cross-reacts with intestinal spirochetes to highlight the organisms in the setting of negative syphilis serologic testing.⁴

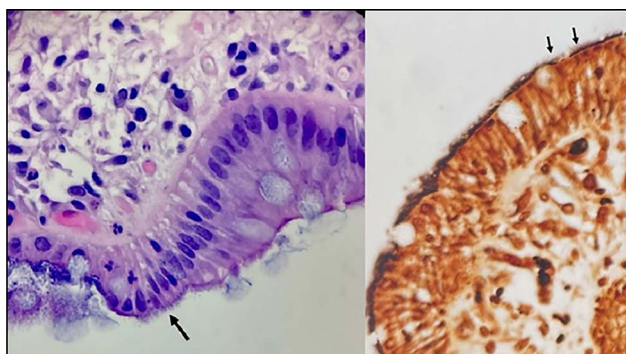


Figure 2. Histopathology of colon biopsies with hematoxylin and eosin (200×) and Warthin-Starry stains, respectively, revealing spirochetes adhered to the mucosa to form a diffuse fringe or “false brush border” (indicated by black arrows) characteristic of intestinal spirochetosis.

IS and lower gastrointestinal (GI) syphilis, including syphilitic proctitis, are both caused by spirochetes but have distinct etiologies, presentations, and histopathology. IS is commonly caused by the commensal organisms *B. aalborgi* and *B. pilosicoli*, which colonize the colorectal mucosa and may present with or without watery diarrhea and abdominal pain. Alsaigh and Foget examined 15 patients with histologically confirmed IS who displayed varied endoscopic appearances ranging from a polypoid appearance, colonic lesion, erythema, to normal-appearing mucosa, suggesting that endoscopic findings may contribute little diagnostic information, as in our case.⁶ Although a “false brush border” is pathognomonic for IS, pathology cannot differentiate between commensal spirochetes and *T. pallidum*, the causative agent of syphilis; therefore, the distinction between IS and lower GI syphilis must be made serologically. This is important in guiding antimicrobial therapy. Newer techniques for identifying *Brachyspira* such as fluorescence in situ hybridization are being investigated but are not readily available.⁷ In contrast to IS, syphilitic proctitis is caused by *Treponema pallidum* and presents in the secondary or tertiary stages of syphilis with rectal pain, discharge, or bleeding. Endoscopy may reveal diverse abnormalities such as diffuse edema, friable mucosa, erosions, ulcerations, masses, and pseudotumors.⁸ Histologic features of lower GI syphilis are dense mononuclear infiltrate with plasma cells, granulomas, and endarteritis with the occasional presence of the spirochetes in the affected tissues, distinguishing it from IS. Moreover, syphilitic proctitis is a manifestation of a systemic sexually transmitted infection that necessitates prompt treatment, whereas IS is often benign and does not always require treatment.^{9,10}

This case demonstrates the importance of considering IS in the differential in HIV-positive patients with nonspecific GI symptoms after more common etiologies have been ruled out. In addition, colonoscopy with biopsy remains invaluable for diagnosis.

DISCLOSURES

Author contributions: The authors listed contributed to manuscript planning, writing, and approval. N. Loganantharaj is the article guarantor.

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Informed consent was obtained for this case report.

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