

A Case Study: Incidental Finding of Human Intestinal Spirochetosis in Screening Colonoscopy

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Abstract

Human intestinal spirochetosis (HIS) is a rare occurrence. We present an interesting case study on an asymptomatic over-60-year-old male who was incidentally discovered to have HIS following a colonoscopy that was conducted for his positive fecal occult blood test (FOBT). Histopathology of the colonic biopsy proved the presence of human intestinal spirochetosis; however, as he was asymptomatic, treatment was not initiated in his case. We discuss here the prevalence, presentation, diagnostic methods, and treatment of colonic HIS.

Categories: Other, Anatomy, General Surgery

Keywords: his, human intestinal spirochetosis (his), colonoscopy, fobt, spirochetosis, human intestinal spirochetosis

Introduction

Human intestinal spirochetosis (HIS) is frequently related to *Brachyspira aalborgi* and *Brachyspira pilosicoli* infections [1]. There is very little literature available describing the pathogenic relevance of these microorganisms to humans. *Brachyspira* are anaerobic bacteria that grow slowly despite being fastidious. There has also been reported difficulty in isolating them and growing them in laboratory conditions [2]. HIS is an uncommon clinicopathological state distinguished by the existence of spiral-shaped microorganisms on the surface of the colorectal mucosa, and occasionally, by their infiltration into the lamina propria [3]. How these spirochetosis are transmitted to humans remains inadequately understood, and there is an ongoing debate regarding whether they function as pathogens or as commensal residents. However, research has indicated that fecal-oral transmission is a possible mode of transmission [4].

Case Presentation

We present an interesting case study of an over-60-year-old male who was referred following a positive fecal occult blood test (FOBT). He has a background of dyslipidemia and gout but no other significant medical history. He was asymptomatic otherwise and reported no overt per rectal (PR) bleed, no diarrhea, no weight loss, and no other constitutional symptoms. He reported no family history of malignancy, and this was his index colonoscopy. Physical examination was unremarkable, and no abnormalities were detected. He was booked for an urgent colonoscopy in view of the positive fecal occult blood test (FOBT).

Moderate diverticulosis mainly in the sigmoid colon was noted in the colonoscopy. There were patchy areas of inflammation noted from the right colon to the distal transverse colon. Random and targeted biopsies of the whole colon were taken. Second-degree hemorrhoids were also noted, which were banded at the end of the procedure. The patient tolerated the procedure well and was subsequently discharged with an outpatient follow-up in the clinic arranged to chase the histopathology report.

The histopathology of the colonic biopsy (Figure 1) from the colonoscopy revealed surface basophilic filamentous in keeping with intestinal spirochetosis (IS). The left colon had some mild focal active colitis with the manifestation of the disease but no significant inflammation was identified in the right colon. The lamina propria was mildly edematous and contained the usual mononuclear cell population with occasional lymphoid aggregates. A layer of blue filamentous organisms was seen on the mucosal surface, in keeping with intestinal spirochetosis. Attached are the images of the biopsy. Figure 1 shows the histology of the colonic biopsy, revealing surface basophilic filamentous in keeping with intestinal spirochetosis, and Figure 2 shows another part of the biopsy concordant with intestinal spirochetosis.

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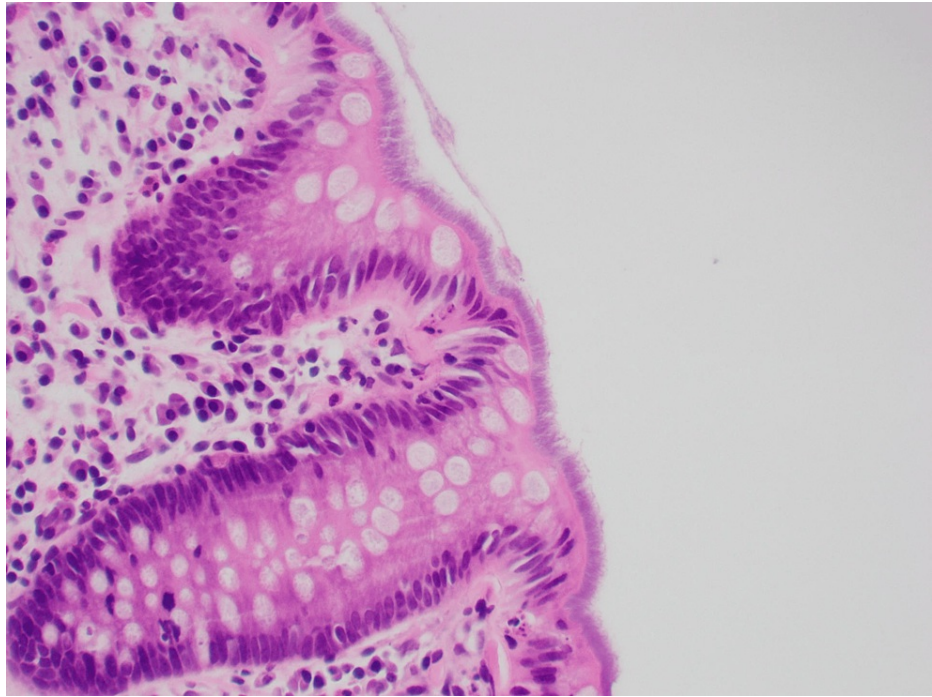


FIGURE 1: Histology of the colonic biopsy revealing surface basophilic filaments in keeping with intestinal spirochetosis

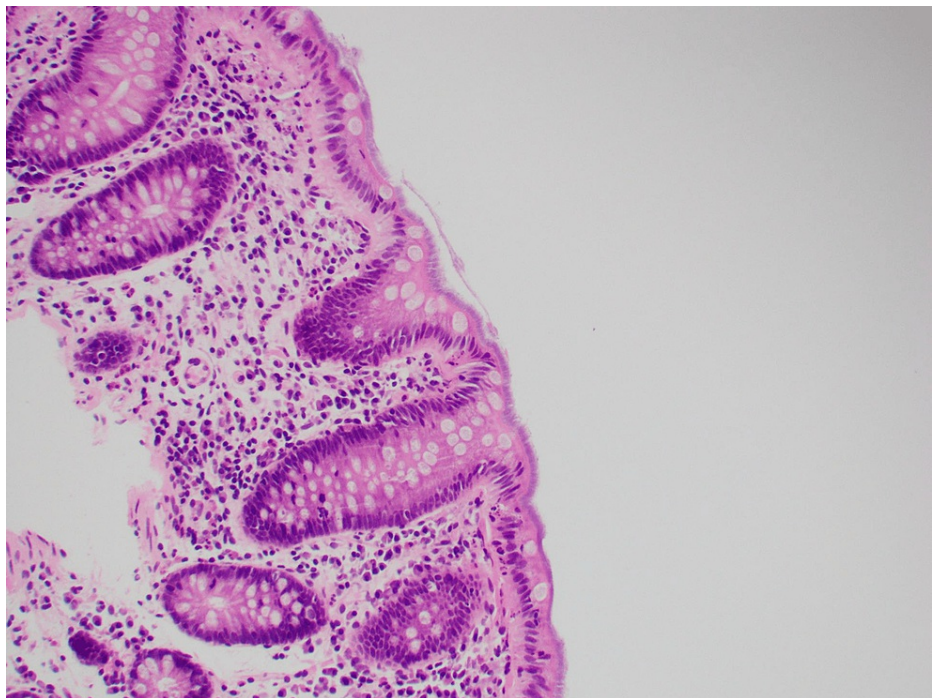


FIGURE 2: Histology of the colonic biopsy in keeping with intestinal spirochetosis

The range of potential differential diagnoses is quite extensive and encompasses several conditions, including (i) irritable bowel syndrome (IBS), (ii) inflammatory bowel diseases like Crohn's disease, (iii) microscopic colitis, and (iv) malabsorptive syndromes like celiac disease, chronic pancreatitis, and lactose intolerance. The surprising factor is that our patient did not exhibit any symptoms throughout. Chronic gastrointestinal infections are often associated with diarrhea, with common microbial culprits, including *Clostridium difficile*, *Vibrio cholerae*, *Salmonella*, *Shigella*, and *Giardia*, but our patient was asymptomatic

throughout. However, in rare instances, the presence of spirochetes colonizing the colon can lead to chronic diarrhea and other associated symptoms.

Discussion

Human intestinal spirochetosis was first discovered in the 1960s by Harland and Lee [1]. The distinctive presence of colonic spirochetosis on the epithelial surface, which is discerned through a standard histological analysis of biopsies obtained during colonoscopy is the gold standard of the diagnosis [2]. The incidence of human intestinal spirochetosis is low but varies between 2.5% and 32.5% and is usually present in the rectum of patients infected with human immunodeficiency virus (HIV) [3]. The prevalence of HIS is higher in West Africa, Southern India, and Asia [4]. Risk factors include immunodeficient states and homosexuality [5]. Frequently, HIS is identified in the screening colonoscopy of patients presenting with vague abdominal pain and chronic watery diarrhea. Colonoscopy findings are generally not specific; they appear either as a normal mucosa, polypoid lesion, or erythematous area [6].

The conventional method of diagnosis involves the histological assessment of colonic biopsy samples [7]. Microorganisms are typically visualized using the hematoxylin-eosin (H&E) stain and observed through light microscopy. In this process, the abnormality becomes apparent on the epithelial surface, characterized by thread-like structures arranged in a palisade-like fashion, often referred to as the "blue fringe."

Human colonic spirochetosis tends to colonize from the proximal to the distal colon, including the vermiform appendix [6]. Intestinal spirochetosis has been uncommonly found in the stomach and small intestine since the 1900s [8,9]. A study in Japan showed HIS has a preference for the right colon [10]. Alsaigh and Fogt conducted a study involving 15 biopsies that confirmed the presence of intestinal spirochetosis through histological examination [6]. Their findings revealed diverse endoscopic manifestations of colonic spirochetosis [11], which included a polyp-like appearance in seven patients, a singular lesion in one patient, and an erythematous region in another patient [9]. A case report presented by Kostman and colleagues detailed a scenario in which a patient with acquired immunodeficiency syndrome (AIDS) exhibited widespread colonic ulceration [12]. Furthermore, for additional clarification, alternative staining techniques, such as Warthin-Starry and Dieterle silver impregnation, can be employed. When examined under electron microscopy, spirochetosis tends to embed itself within colonic cells without invading them. These spirochetosis are observed attaching to the cell membrane, typically within areas where microvilli have been damaged or destroyed [13].

The severity of the patient's symptoms and their clinical presentation should guide the decision on whether to treat intestinal spirochetosis or not. IS may manifest either without symptoms, as in our patient, given that the organisms believed to be responsible maintain a commensal relationship with the normal gut flora, or with symptoms related to gastrointestinal issues, as these organisms can also take on an invasive and pathogenic nature [10]. For patients without symptoms, a conservative approach can be considered using the 'wait-and-watch' principle. Symptomatic patients benefit from monotherapy, metronidazole (500 mg 4 times a day for 10 days) [9]. It outperforms the use of macrolides, clindamycin, and a combination of macrolides with metronidazole. In situations involving co-infection, a combination of antibiotic therapies might be necessary. The dosage and duration of treatment can vary, contingent on factors like age and body weight [14].

Unfortunately, there have been some reported relapse of symptoms in patients treated with metronidazole on follow-up. This is likely attributed to re-infection or incomplete eradication [15]. Research conducted by Jabbar and colleagues revealed that metronidazole treatment had the paradoxical effect of encouraging the relocation of *Brachyspira* into the colonic crypts and goblet cell granules [15]. This observation suggests a potential bacterial strategy for evading antibiotic exposure [16].

Conclusions

In a nutshell, intestinal spirochetosis is an uncommon cause of abdominal pain and diarrhea in immunocompetent patients. Although it usually happens in HIV patients, there are more reports available on its existence in healthy individuals. Biopsy via an endoscopic procedure is the main method of diagnosis. Treatment of these patients depends on the patient's clinical presentation and the severity of its manifestation. For our patient, since he did not exhibit any symptoms, it was best to employ the 'wait-and-watch principle' and treat him if he happens to develop any symptoms in the future.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Bhovineey Ramanathan, Vinod Ramachandran, Abdul Rana, Christopher McDonald

Acquisition, analysis, or interpretation of data: Bhovineey Ramanathan, Vinod Ramachandran, Abdul Rana

Drafting of the manuscript: Bhovineey Ramanathan, Vinod Ramachandran, Christopher McDonald

Critical review of the manuscript for important intellectual content: Bhovineey Ramanathan, Vinod Ramachandran, Abdul Rana, Christopher McDonald

Supervision: Abdul Rana, Christopher McDonald

Disclosures

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