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Strongyloidiasis Presenting as Yellowish Nodules in Colonoscopy of an Immunocompetent Patient

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Strongyloides stercoralis is endemic to tropical and subtropical regions, and infections are usually asymptomatic. However, immunocompromised patients, such as those receiving immunosuppressive therapy, high-dose steroids, or chemotherapy, can develop fatal hyperinfections. An 84-year-old man without any symptoms was diagnosed with strongyloidiasis during a regular screening colonoscopy. His medical history only involved a gastric endoscopic submucosal dissection for early gastric cancer 6 months previously. Few cases have been published about asymptomatic strongyloidiasis diagnosed in an immunocompetent host via endoscopic mucosal resection with characteristic colonoscopic findings. We report a case of colon-involved asymptomatic strongyloidiasis with specific colonic findings of yellowish-white nodules. This finding may be an important marker of *S. stercoralis* infection, which could prevent hyperinfections. **Clin Endosc 2019;52:80-82**

Key Words: Colonoscopy; Endoscopic mucosal resection; Strongyloidiasis

INTRODUCTION

Strongyloides stercoralis infections are endemic in tropical and some temperate areas where poor hygiene promotes transmission.^{1,2} In immunocompetent patients, strongyloidiasis is usually either asymptomatic or causes mild gastrointestinal symptoms, such as dyspepsia, nausea, and vomiting. However, it can lead to an overwhelming hyperinfection syndrome caused by autoinfection, or a disseminated form of strongyloidiasis triggered by acquired or iatrogenic immunosuppression with severe sepsis.^{3,4} Corticosteroid use, chemotherapy, a cancerous state, and human immunodeficiency virus (HIV) infection are factors involved in hyperinfection syndrome.⁵

S. stercoralis has two different reproductive cycles: an asexual cycle that occurs inside humans, particularly in the duodenum and small intestine, and sexual reproduction in the soil. The parasite has the ability to multiply inside the host while transforming the rhabditiform larvae into the infective filariform stage when environmental conditions change.⁶

The upper endoscopic features of strongyloidiasis have been reported.⁷ However, colonoscopic-specific findings have not, other than a broad range of features.⁸ Herein, we report a case of strongyloidiasis with no symptoms in an immunocompetent host that was discovered incidentally as a result of a specific colonic finding.

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CASE REPORT

An 84-year-old man presented to our hospital for an upper endoscopy due to dyspepsia. Esophagogastroduodenoscopy (EGD) detected erythematous gastric mucosa with an irregular margin, and biopsy revealed early gastric cancer. He therefore underwent endoscopic submucosal dissection (ESD). Approximately 6 months later, with no symptoms, he

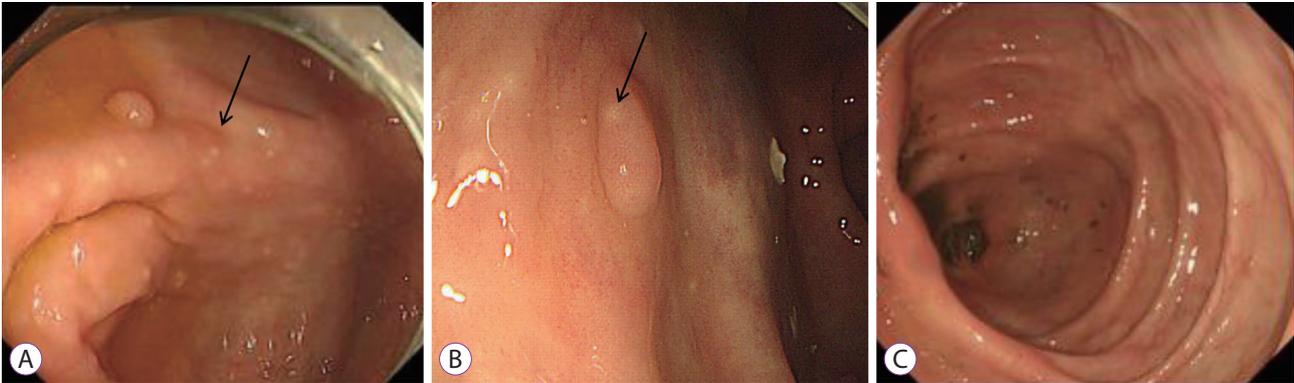


Fig. 1. Colonoscopic findings showing (A) multiple yellowish nodules and polyps in the ascending colon, and (B) yellowish nodules were found on the top of a polyp (before treatment). (C) The nodules disappeared after treatment.

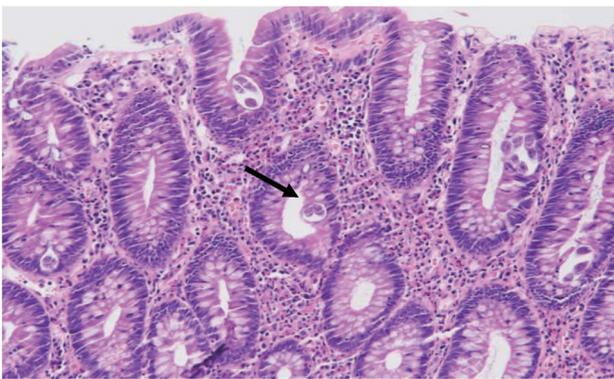


Fig. 2. Histological findings. Numerous cross-sectioned filariform larvae (arrow) with distortion of crypts and diffuse eosinophilic infiltration are visible in the lamina propria of the colon (hematoxylin and eosin, $\times 200$).

attended the hospital again for a follow-up and also requested a colonoscopy because he had no colonoscopy experience. His physical examination was normal except mild conjunctive anemia. No abdominal pain (direct or rebound tenderness) was detected.

The results of peripheral blood tests were as follows: hemoglobin 10.0 g/dL, hematocrit 33.2%, and white blood cell count $9,530/\text{mm}^3$ (neutrophils 41.2%, lymphocytes 26.3%, and eosinophils 25.4%). The total eosinophil count was $2,420.62/\text{mm}^3$ (normal range of total eosinophil $40\text{--}500/\text{mm}^3$ [1%–6%]), and the platelet count was $261,000/\text{mm}^3$. Other data were as follows: blood urea nitrogen 29.9 mg/dL, creatinine 1.0 mg/dL, total protein 6.9 g/dL, albumin 4.0 g/dL, total bilirubin 0.7 mg/dL, aspartate aminotransferase 18 IU/L, alanine aminotransferase 10 IU/L, sodium 138 mEq/L, potassium 4.4 mEq/L, calcium 8.9 mg/dL, prothrombin time 12.0 s, and activated partial thrombin time 33.1 s. Urinalysis was normal. He had no history of receiving glucocorticoid therapy and was negative for HIV. There was no evidence of recurrence at the ESD site, and no metastasis to lymph nodes or other organs was detected in an abdominal computed tomography scan.

Diffuse atrophic gastritis was observed during the EGD, and an ESD scar was seen at the lesser curvature side of the lower body; the duodenum was normal. Edema of the right colon (especially the ascending colon) wall with multiple 10–20 mm polyps and 0.5–1 mm diffuse yellowish-white nodules were seen during the colonoscopy in the ascending colon. Twenty-four colonic polyp specimens were removed by endoscopic mucosal resection or polypectomy through the ascending colon (Fig. 1). Yellowish nodules were found on the top of the polyps, and polypectomy was performed. A pathological examination revealed filariform larvae and eosinophilic infiltration in the mucosal layer of the ascending colon (Fig. 2). After taking 400 mg albendazole for 3 days, the *S. stercoralis* larvae and yellowish nodules were not seen at a year follow-up colonoscopic random biopsy, and his eosinophil count returned to the normal range as $661.8/\text{mm}^3$ (6%).

DISCUSSION

Strongyloidiasis can have many colonoscopic features, such as loss of the vascular pattern, erythema, and mild edema to ulcers, erosions, and yellowish-white nodules.⁸ If *S. stercoralis* infects the colonic mucosa, eosinophils will collect and form granulation tissue on the mucosal surface. Dense eosinophilic infiltrations may appear macroscopically as yellowish-white nodules. These nodules are a strong indicator of strongyloidiasis colonic involvement compared to other nonspecific characteristics. At a single center on an endemic island of Japan, a study found that colonoscopic findings, such as yellowish-white nodules, and biopsies could be useful to diagnose asymptomatic strongyloidiasis.⁹ To the best of our knowledge, this is the first case report of yellowish-white nodules during a colonoscopy in a case of strongyloidiasis in Korea.

S. stercoralis can infect both immunocompromised and immunocompetent hosts. Most cases of strongyloidiasis have

mild symptoms or are asymptomatic (30%), but hyperinfection can be very severe and results in death in 60% of cases.¹⁰ This infection involves different organs in the host. For example, *S. stercoralis* present in the gastrointestinal tract can cause vomiting, diarrhea with abdominal pain, and hyponatremia, even in young men.¹¹ It can produce mild upper respiratory symptoms, cough, sputum or diffuse alveolar hemorrhage, and severe hypoxemia after infecting the lung.¹² Chronic anemia can also result from strongyloidiasis-related disease in hepatic cirrhosis patients with severe alcoholism.⁶

Diagnosis of *S. stercoralis* hyperinfection can be difficult to confirm. In a previous study, the Kato-Katz technique, stool microscopy, the Baermann technique, and Koga agar plate cultures were used to detect *S. stercoralis* infection; however, these methods are inadequate because of low sensitivity. Serological testing has higher sensitivity and is useful for follow-up diagnosis.¹³ The luciferase immunoprecipitation system technique and enzyme-linked immunosorbent assay (ELISA) coproantigen detection tests are promising assays with 100% specificity, but they require further evaluation to confirm their efficacy in predicting infection.¹⁴ Only 2% of *S. stercoralis* infections are detected by an EGD.¹⁵ Eggs and adult worms have been seen in the duodenum, and larvae have been observed in the small intestine.⁸ Capsule endoscopy may be useful to detect larvae in the small intestine, but it is expensive. In the present case, a stool examination and ELISA were not used for the initial diagnosis; the patient showed no symptoms, so parasitic infection was not suspected at that time. Statistically, 25% of infected patients produce a negative result for these tests.¹⁶ We found *S. stercoralis* filariform larvae in histological sections from a colonoscopic biopsy (Fig. 2). A previous case report detailed *S. stercoralis* infection in an immunocompromised host with a risk factor of high-dose steroids, which was diagnosed by colonoscopic biopsy of multiple polyps in diffuse pancolitis.¹⁷ A case of pancolitis with strongyloidiasis has been reported in an immunocompetent patient.⁹ Strongyloidiasis has also been diagnosed by capsule endoscopy in an immunocompetent host. However, in those cases, both patients had abdominal pain and severe diarrhea, whereas our patient was asymptomatic.⁵

The strongyloidiasis treatment of choice has been thiabendazole 25 mg/kg/12 h for 3 consecutive days; however, a single dose of 15 mg ivermectin is currently being used because of better tolerability and similar efficacy.¹⁸ Our patient received 400 mg albendazole orally for 3 days and was cured without complications.

In conclusion, we report a case of *S. stercoralis* infection involving the ascending colon in an immunocompetent host, with specific yellowish-white nodules. If a patient has yellowish nodules in the colon, a biopsy should be performed to

detect strongyloidiasis and prevent a hyperinfection.

Conflicts of Interest

The authors have no financial conflicts of interest.

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