

Two Cases of Strongyloidiasis Diagnosed by Colonoscopic Biopsy

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Received : March 6, 2007
Accepted : May 10, 2007

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Strongyloides stercoralis is an intestinal nematode that is able to infect the host tissue and persist for many years through autoinfection, and it causes life-threatening hyperinfection in immunocompromised hosts. We report here on two cases of strongyloidiasis that were diagnosed by colonoscopic biopsy. One case was a 73-year-old woman who was hospitalized with complaints of melena. She was being treated with corticosteroid due to her asthma and rheumatoid arthritis. The other case was a 63-year-old man who suffered with abdominal discomfort and severe loss of body weight (18 kg) for 2 months. In both cases, colonoscopic examination revealed polyps and petechiae at the entire colon. Microscopically, a small ill-defined granuloma with a longitudinally sectioned parasite was seen on the colonoscopic biopsy. Endoscopic examination was done after suspecting parasitic infestation. The gastric and duodenal mucosa showed numerous cross sections of adult worms, eggs and larvae that were developing in crypts. Even if such a patient is in an asymptomatic state, this illness must be treated due to the potential for fatal autoinfection.

Key Words : *Strongyloides stercoralis*; Colonoscopy

Strongyloidiasis is endemic in many countries throughout the tropical and temperate regions, but its prevalence is low in Korea.¹⁻⁴ It is also associated with poor sanitation. Humans are infected by the third-stage filariform larvae of *Strongyloides stercoralis*. After they penetrate the skin, petechiae, maculopapular rashes and urticaria occur.⁵ They then migrate via the respiratory tree, are swallowed with sputum and they eventually mature into the adult form in the duodenum and upper jejunum. The host-parasite relationship can be broken due to certain predisposing factors such as corticosteroid therapy, anticancer drug, malnutrition, severe burn and so on.^{2,6,7} This gives rise to a pathologic state of hyperinfection, causing clinical manifestations in many organs.⁸ Yet the diagnosis of strongyloidiasis can be difficult because the clinical symptoms, and especially the gastrointestinal manifestations, may vague or mimic several other conditions such as inflammatory bowel diseases, and the worm is observed in only 2% of patients on endoscopic mucosal biopsy.^{5,9} Herein, we report on two cases of severe strongyloidiasis that were diagnosed by colonoscopic biopsy.

CASE REPORTS

Case 1

A 73-year-old woman was hospitalized with complaints of melena (about 400-500 cc) for a day. She had experienced intermittent abdominal pain, loose stool, fever and chills for last 1 month. In addition, after being diagnosed with bronchial asthma 5 months ago, she was being treated with a corticosteroid agent and cushingoid features were also noted in her appearance. The routine laboratory tests, including CBC and blood chemistry, were all unremarkable. Colonoscopic and endoscopic examinations were performed under the impression of gastrointestinal ulcer bleeding. Any definite bleeding focus was not found on colonoscopic examinations, but there was diffuse pancolitis with multiple congested polyps and petechiae on the entire colon. A biopsy was taken and a parasite-like organism was found in a capillary (Fig. 1A). Eosinophilic abscess formation was also noted (Fig. 1B). After this suggestion of parasitic infection, an upper gastrointestinal endoscopic examination was done and diffuse mucosal hyperemia and edema were seen

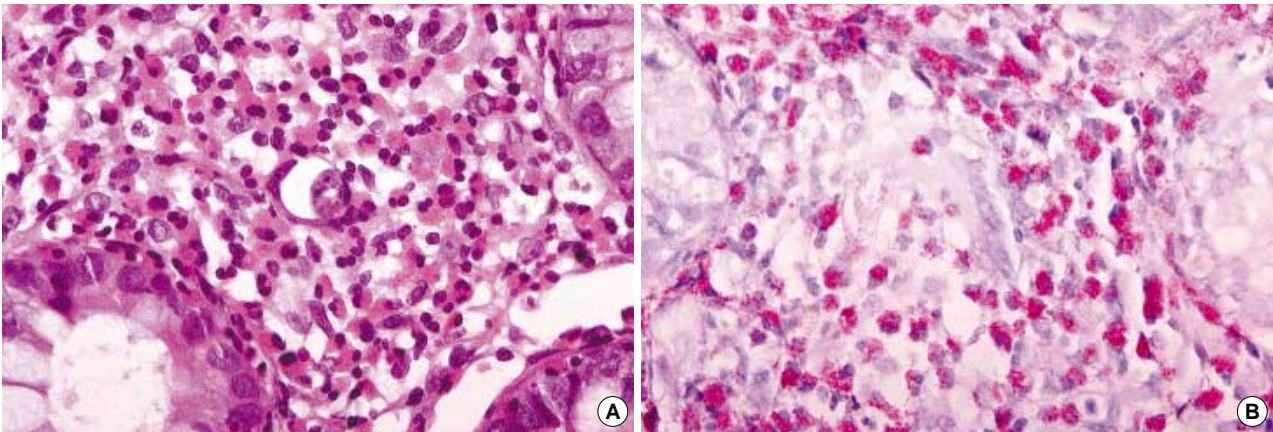


Fig. 1. Occasionally, a larva is found in a capillary. (A) In this lesion, heavy infiltration of eosinophils, forming an eosinophilic abscess, are well visible around a degenerated larva (B, Giemsa stain).

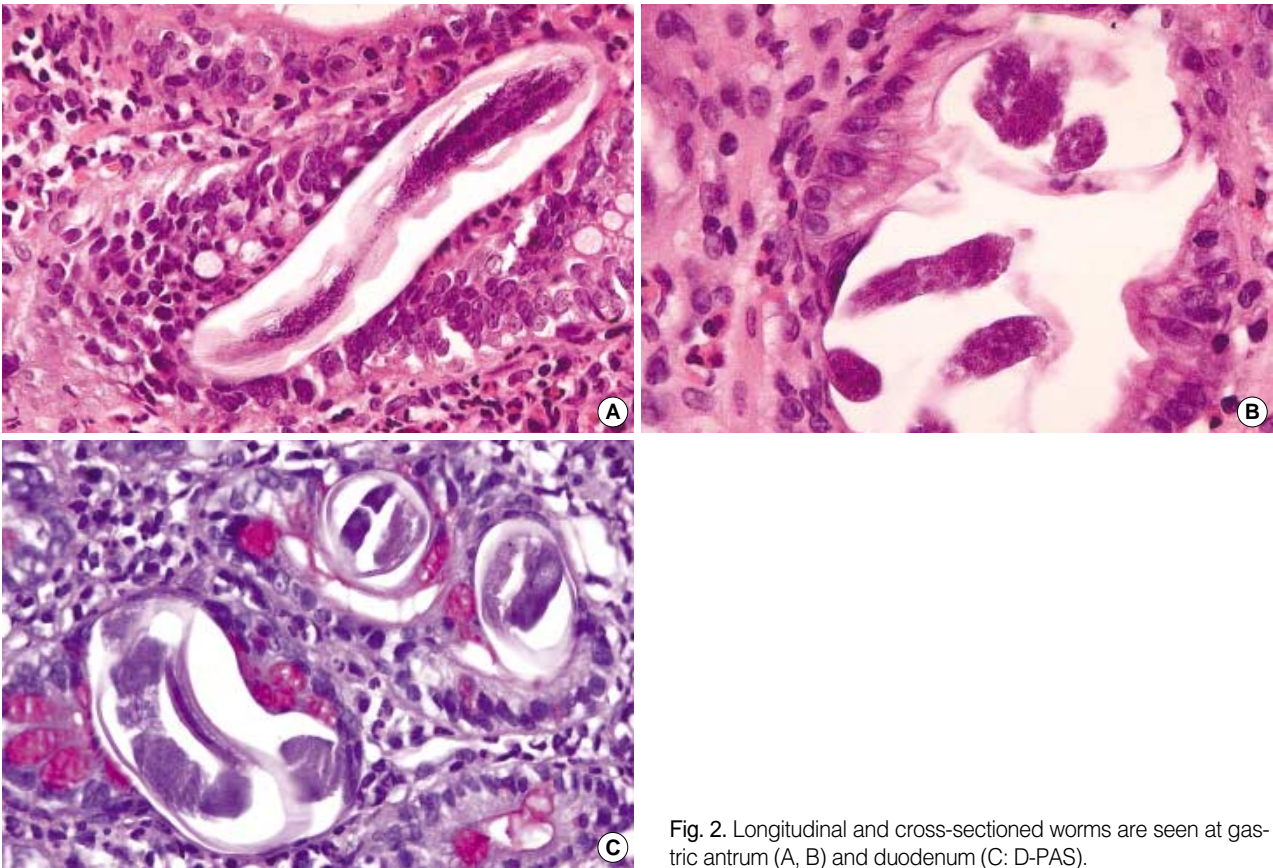


Fig. 2. Longitudinal and cross-sectioned worms are seen at gastric antrum (A, B) and duodenum (C: D-PAS).

at the duodenum and antrum.

Histopathological examination of the gastric and duodenal mucosa showed numerous cross sections of adult worms, eggs and larvae developing in the crypts (Fig. 2). The body wall of the adult worm was composed of cuticle and a weak muscle area. Stool and duodenal lavage fluid examination at the Department of Parasitology in Kyungpook National University School

of Medicine revealed many adult worms of *Strongyloides stercoralis*.

Case 2

A 63-year-old man was admitted in our hospital due to abdominal discomfort he had suffered with for 2 months. He was also experiencing intermittent lower abdominal pain, diar-

rhea, anorexia and postprandial discomfort. Noticeably, there was a severe loss of body weight, 18 kg for 2 months. On the laboratory tests, eosinophilia was not found (1.6%, normal: 1-3%), but the result of the serum C3 test (39.8 mg/dL, N: 90-180) was out of the normal range. The other laboratory tests were all unremarkable. Duodenal cancer or malabsorption was clinically suspected at the time of the initial studies. Yet the abdominal computed tomography and ultrasonography revealed no definite mass lesion; the tumor markers, including α FP, CA125 and CA19-9, were within normal limits. Colonoscopic examination was then done to rule out colon cancer because his bowel habits had changed for 2 months. Elective colonoscopy revealed multiple, whitish-yellow nodules with superimposed erythema on the entire colon. On pathologic examination, the colonic mucosa showed eosinophilic crypt abscess with ill-defined granulomas. This case was also suspected to be parasitic infestation after the colonoscopic biopsy. Subsequently, endoscopy revealed diffuse minute whitish-yellow nodules with mucosal hyperemia at the antrum. Also, on the light microscopy, there were adult worms, eggs and larvae. Additionally, the stool examination revealed *Strongyloides stercoralis*.

DISCUSSION

Strongyloides stercoralis is a common parasite of the gastrointestinal tract, and this is especially common in the tropical and temperate areas. Yet in Korea, this disease has a low prevalence and several authors have occasionally reported its presence on stool examination.¹⁻³ The adult worm of *Strongyloides stercoralis* usually lives buried in the crypts of the proximal small intestine, producing eggs that develop into rhabditiform larvae in the mucosa, but they do not usually pass through the muscularis mucosa. It can also infect extraintestinal organs (lung, liver, pancreas, brain and meninges) with the patient in a hyperinfection state.²

Human infection occurs when filariform larvae penetrate the intact skin. This most commonly happens when the host's bare feet come in contact with soil contaminated with infective *Strongyloides* larvae.³ Once infected, most people have an asymptomatic, chronic infection of the gastrointestinal tract. However, because of the unique ability of *Strongyloides stercoralis* to complete its life cycle within a human host, the burden of worms can dramatically increase through a cycle of autoinfection. Autoinfection can lead to disease persistence as well as to hyperinfection syndrome, where the disease is disseminated with the patient

exhibiting impaired cellular immunity. Generally, both cellular and humoral immunity are related with *Strongyloides stercoralis* infection. However, deficit cellular immunity is more important, suggesting that hyperinfection is more likely related to AIDS, administering immunosuppressive agents, malignant lymphoma and chemotherapy.^{5,10}

There are several barriers to making a prompt diagnosis of strongyloidiasis in Korea. First, since it is generally considered a tropical disease, Korean physicians may not be familiar with it. Second, the usual clinical presentation of gastrointestinal symptoms is nonspecific, and a wide range of clinical manifestations can occur decades after infection, from no symptoms to multiorgan failure. Moreover, the sensitivity of stool examination for parasites is poor. Examination of a single stool sample may miss 70% or more of cases owing to a low parasite burden and intermittent larvae excretion. Third, eosinophilia, which is usually common in strongyloidiasis without hyperinfection, is often absent in disseminated disease. In fact, the absence of eosinophilia may indicate a poor prognosis.^{5,7}

The clinical signs of strongyloidiasis include gastrointestinal (abdominal pain, diarrhea, nausea and vomiting), skin (rash, urticaria, itching sensation) and respiratory symptoms (cough, wheezing).⁴ In many instances, the laboratory diagnosis of strongyloidiasis is usually made by the finding of rhabditiform larvae on the stool examination. However, a routine stool exam may fail to find larvae when the intestinal worm burden is very low and the output of larvae is minimal.⁷ Fortunately in our cases, the rhabditiform larvae were found on the first stool examination. Aside from stool examination, *Strongyloides* infection also can be diagnosed via serologic assay (ELISA), duodenal fluid aspiration and sputum study.⁹ Sometimes, other parasite larvae than strongyloidiasis are first found in the mucosal biopsy specimens. In these instances, there is less confidence in the specificity of identifying the parasite. The differential diagnosis may include *Ascaris lumbricoides*, *Necator americanus*, dog hookworm and so on.¹¹ Measuring the absolute length and width of a parasite is difficult and of no real use. At this time, the relative size of the parasite, the type of intestine, and the size and presence of genital organs are helpful to rule out other parasitic infections.^{3,5,12} The Harada-Mori filter paper culture gives birth to the filariform larvae from the rhabditiform larvae, and this enables physicians to differentiate *S. stercoralis* infection from other gastrointestinal nematode infections. To get the best results, it is recommended to inspect the specimen more than three times and to repeat the stool examination at an interval.^{4,7} Treatment depends on the patient's clinical status and their underlying

condition, but it is usually straightforward and the resolution of symptoms and mucosal abnormalities is rapid.²

Strongyloidiasis is a curable disease because early diagnosis and appropriate therapy can reduce the morbidity and mortality. Particularly, there is a risk of undiagnosed infection in an urban center where *Strongyloides* infection is rare. Aside from such complications as bowel wall fibrosis and septicemia, serious sequelae also can result if strongyloidiasis is not recognized and if empiric treatment for colitis is started with administering a corticosteroid.¹² The definitive diagnosis depends on the demonstration of *S. stercoralis* larvae in the feces or duodenal fluid.

In conclusion, we report here on two cases of strongyloidiasis that were diagnosed by colonoscopic biopsy. It is difficult to accurately diagnose and properly manage this disease because of its rarity and unusual histology. Yet the experienced pathologist can suspect its filariform larvae via performing colonoscopic and gastro-duodenal mucosal biopsy.

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