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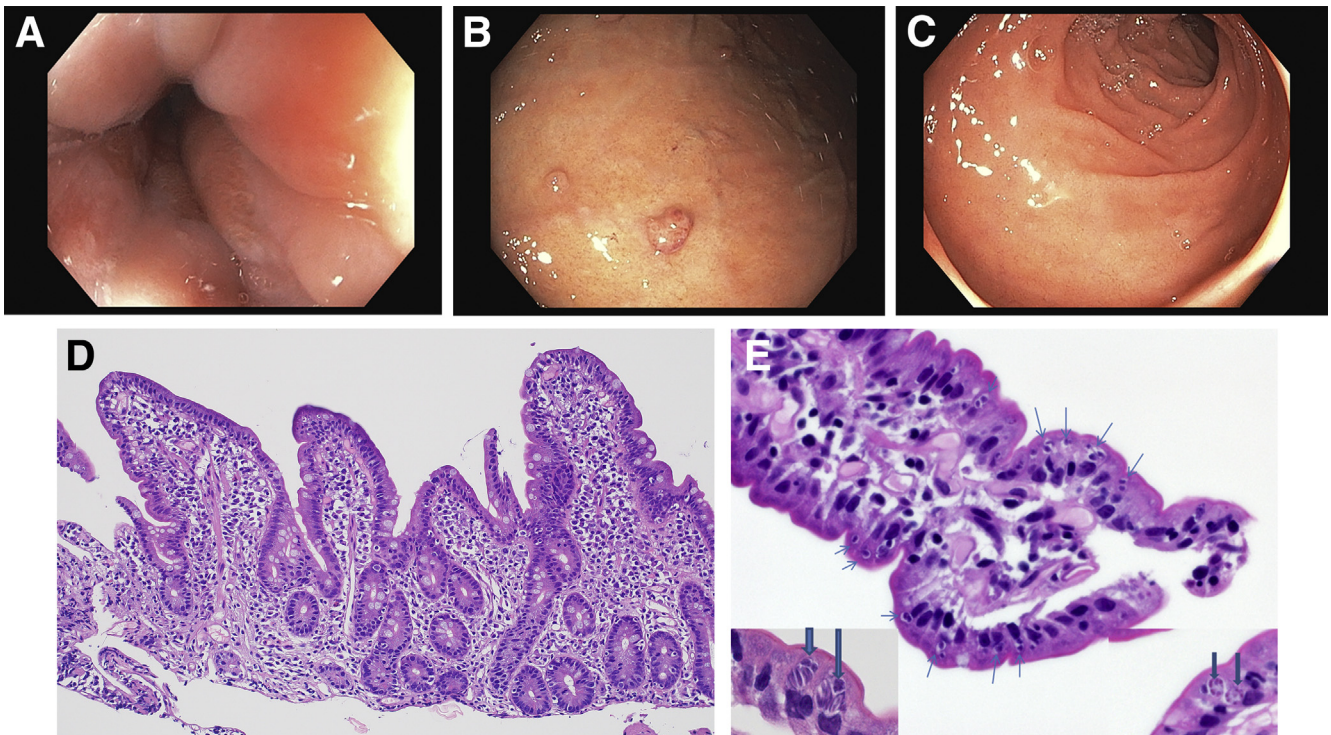
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Uncommon Cause of Emesis and Diarrhea in a Nonverbal Elderly Patient



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Question: An 80-year-old nonverbal man presented to the emergency department accompanied by his sister who provided the history of his recent illness. Three days before his visit, the patient started to experience nausea, vomiting, diarrhea, abdominal bloating, fatigue, dyspnea, and fever (100.1°F). His appetite was unchanged. Physical examination showed abdominal distension with no abdominal tenderness and breath sounds were normal. There was no history of recent travel, trauma or exposure to COVID-19. Past medical history was significant for type 2 diabetes, hyperlipidemia, hypertension, chronic kidney disease stage 3, and deafness. Laboratory studies on admission, including complete blood count with differential and basic metabolic panel were unrevealing, except for elevated blood glucose level (448 mg/dL).

A computed tomography scan of abdomen and pelvis showed diverticulosis but was negative for inflammation, distention or obstruction of small bowel or colon. Due to the persistence of his symptoms, upper endoscopy was performed. Representative images of the lower third of esophagus (Figure A), stomach body (Figure B), and small bowel (Figure C) are shown. Biopsies were obtained. Representative histologic images from the small bowel are shown (Figure D, E). Testing for COVID-19 was obtained and stool sample was sent to microbiology for stool multiplex polymerase chain reaction (PCR) panel (BioFire FilmArray GI panel), which detects 21 gastrointestinal pathogens.

ELECTRONIC CLINICAL CHALLENGES AND IMAGES IN GI

Based on the clinical presentation and images what is the most likely etiology for patient's diarrhea and emesis?

See the *Gastroenterology* web site (www.gastrojournal.org) for more information on submitting your favorite image to Clinical Challenges and Images in GI.

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Conflicts of interest

The authors disclose no conflicts.

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ELECTRONIC CLINICAL CHALLENGES AND IMAGES IN GI

Answer to: Image 3: Diarrhea and Emesis Caused by *Cyclospora cayetanensis* (cyclosporiasis) Infection

Upper endoscopy showed reflux esophagitis (Figure A), gastric polyps (Figure B), and unremarkable small bowel (Figure C). The biopsy from the small bowel revealed villous blunting and lamina propria chronic inflammation at low power (Figure D). High magnification demonstrated intracellular organisms in the apical enterocytes consistent with *Cyclospora cayetanensis* (Figure E, arrows). The organisms were in multiple life stages. Some enterocytes had meronts containing banana shaped merozoites (Figure E, bottom left), whereas others contained gametocytes (Figure E, bottom right). Stool multiplex PCR was also positive for *Cyclospora cayetanensis*. A nasopharyngeal swab tested by a laboratory developed severe acute respiratory syndrome coronavirus-2 reverse transcriptase polymerase chain reaction was negative. The patient was started on trimethoprim/sulfamethoxazole (TMP 160–SMX 800 mg every 12 hours for 7 days) and his symptoms improved.

Cyclosporiasis is an intestinal illness caused by the protozoan parasite, *Cyclospora cayetanensis*.^{1,2} Infection is acquired via consumption of food (commonly leafy vegetables, berries, basil, and cilantro) or water contaminated by sporulated oocysts. Infected individuals shed unsporulated (noninfective) oocysts (8–10 μm in diameter) in the stool. These require 1–2 weeks of favorable environmental conditions to sporulate and become infective; therefore, direct person-to-person transmission is not thought to occur. As a result, this parasite is seen primarily in settings with poor sanitation and inadequate waste disposal facilities. The parasite is endemic in tropical and subtropical regions of Central and South America, Asia, and Africa, and is rare in the United States, where most of the cases are related to international travel or ingestion of imported fresh produce from Latin America.

There was a recent cyclosporiasis outbreak in the United States linked to a bagged salad mix, which is the presumed exposure in our patient. After the ingestion of sporulated oocysts, the oocysts excyst in the gastrointestinal tract, freeing the sporozoites, which then invade the enterocytes of the small intestine. Inside the cells they undergo asexual multiplication into type I meronts (containing 8–12 merozoites 3–4 μm long) and type II meronts (containing 4 merozoites 12–15 μm long). Merozoites from type II meronts undergo sexual development into macrogametocytes and microgametocytes upon invasion of another host cell.³ Fertilization occurs, and the zygote develops into an oocyst which is released from the host cell and shed in the stool. Trimethoprim/sulfamethoxazole given twice a day for 7–10 days is the treatment of choice.

Keywords: Small Bowel; Infectious Diseases; Cyclosporiasis.

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