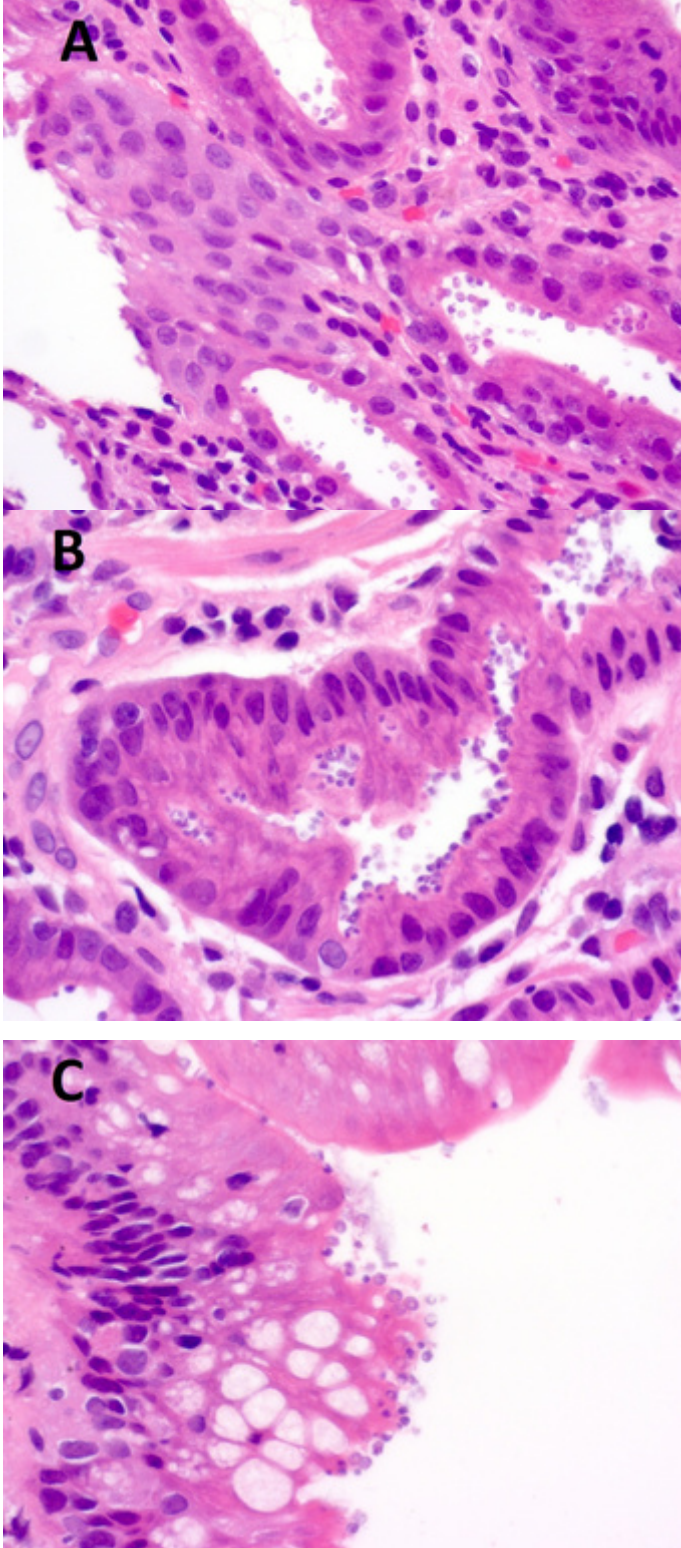
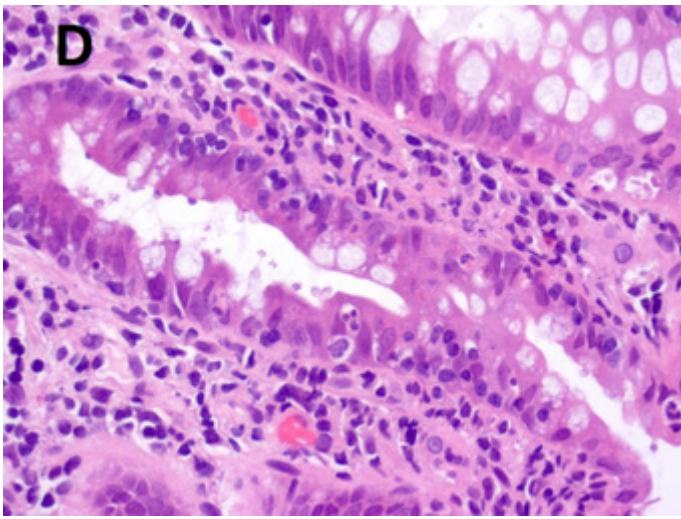


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A 37 year old African male with a malnourished appearance, chronic watery diarrhea and unremarkable upper and lower endoscopy.

What is your diagnosis?





Diagnosis:

Disseminated gastrointestinal cryptosporidiosis.

Comment:

Cryptosporidium parvum, a coccidian parasite with a worldwide distribution, is increasingly being recognised as a cause of traveller's diarrhea. Individuals at high risk for contracting cryptosporidiosis include children, the elderly and immunocompromised patients (especially those with HIV infection). The latter are also at risk for severe and disseminated infection. On further investigation, this patient was found to be HIV-positive with a CD4 count of 26/ μ l. Endoscopic biopsies from the esophago-gastric junction (panel A), stomach (panel B), small bowel (panel C) and large bowel (panel D) all showed involvement by cryptosporidiosis.

Transmission of the organism occurs via the faecal-oral route and by consumption of contaminated food and water. Symptoms include a non-bloody, watery and sometimes mucoid diarrhoea, as well as (particularly in the immunocompromised) abdominal cramps, malaise, weight loss, nausea, vomiting and fever. Although the organisms primarily infect the small bowel, dissemination can occur to other parts of the GI tract, as well as the pancreaticobiliary tract and gallbladder. Often endoscopic biopsies reveal no or mild, non-specific changes. Small intestinal villous blunting and epithelial disarray, patchy mixed inflammatory cell infiltration and, less often, neutrophilic cryptitis (panel D) and prominent eosinophil infiltration may also be seen.

The parasites are identified as multiple, 2 - 5 μ m basophilic spheres ("blue beads") attached to the surface and glandular / crypt epithelial apical membrane. *Cryptosporidium* spp. is positive with Warthin-Starry, Giemsa and gram stains. The organisms need to be differentiated from mucin droplets adherent to the epithelial luminal surface, as well as other coccidian parasites (especially *Cyclospora cayentanensis* and microsporidia).

Cryptosporidium spp. may easily be missed on cursory examination of biopsy material, particularly in otherwise healthy patients with a very low organism burden.

Cryptosporidiosis is usually self-limiting in immunocompetent patients, but may be life-threatening due to dehydration and malabsorption in the immunocompromised. There is currently no uniformly effective therapy for this parasitic infection, with nitazoxanide usually being the medical therapy of choice.

For further reading:

- › Lamps LW. Surgical Pathology of the Gastrointestinal System. 2009, Springer, New York, pp 183-184.
- › Geboes K. Inflammatory disorders of the small intestine. In: Shepherd NA, Warren BF, Williams GT, Greenson JK, Lauwers GY, Novelli MR (eds). Morson and Dawson's Gastrointestinal Pathology, 5th Ed. Wiley-Blackwell, Chichester, pp 330-332.

- › Slavik T, Lauwers GY. Navigating the jungles of tropical infectious gastrointestinal pathology: a pattern-based approach to the endoscopic biopsy. *Virchows Archiv* 2017; DOI 10.1007/s00428-017-2166-3.

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