

Mesenteric Panniculitis Associated With *Vibrio cholerae* Infection

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Abstract

We report the first case of acute *Vibrio cholerae* infection with computed tomography (CT) changes consistent with mesenteric panniculitis (MP). A 78-year-old Indian man returned from overseas travel with progressively severe nausea, vomiting, abdominal pain, and watery diarrhea. His stool tested positive twice for *Vibrio cholerae*. CT revealed prominent lymph nodes and a hazy mesentery consistent with MP. Antibiotic treatment resulted in complete resolution of MP on follow-up CT 8 months later. In the setting of *Vibrio cholerae* infection, the CT finding of MP appears to be the result of an immunologically mediated reactive inflammatory disorder of the mesentery.

Introduction

Mesenteric panniculitis (MP) is an uncommon computed tomography (CT) finding that has been defined radiographically by the presence of a “misty” or “hazy” mesentery and/or an unexplained mesenteric mass. Inflammatory cells and fat necrosis are found on biopsy specimens from affected portions of the mesentery. The clinical course of MP is not very well characterized, and reports are inconsistent.¹⁻³ A variety of conditions are associated with the development of MP, including abdominal trauma and autoimmune disease, while lymphoma, solid tumors, and carcinoid tumor may have similar appearances on CT scan.^{2,4-9} Few infectious disease associations with MP have been described in the literature, although mycobacterial and cryptococcal infections, intra-abdominal abscess, and fever of unknown origin have previously been included as causes of mesenteric abnormalities.^{3,10-12} Little is known about how *Vibrio cholerae* or its toxin affects the mesentery and mesenteric lymph nodes. Several animal studies have shown that immunization with *Vibrio cholerae* could produce agglutinins or increase antibody formation in the mesenteric lymph nodes, leading to inflammation.¹³⁻¹⁶

Case Report

A 78-year-old Indian man returned from a 3-week trip to India with symptoms of nausea, vomiting, abdominal pain, and watery diarrhea. He was afebrile. The patient had approximately 12 episodes of diarrhea with syncope. He did not take any antibiotics while in India. He had lived in India until 1999, when he immigrated to United States, but continues to travel to India on a yearly basis. He did not have any prior episodes of infectious gastroenteritis or chronic gastrointestinal symptoms. The patient had a normal colonoscopy 3-4 years prior to this episode. Physical examination revealed dry mucus membranes and mid-abdominal tenderness. Laboratory tests revealed mild leukocytosis, neutrophilia of 82.6%, C-reactive protein of 22.6 mg/L, and sedimentation rate of 21 mm/hr.

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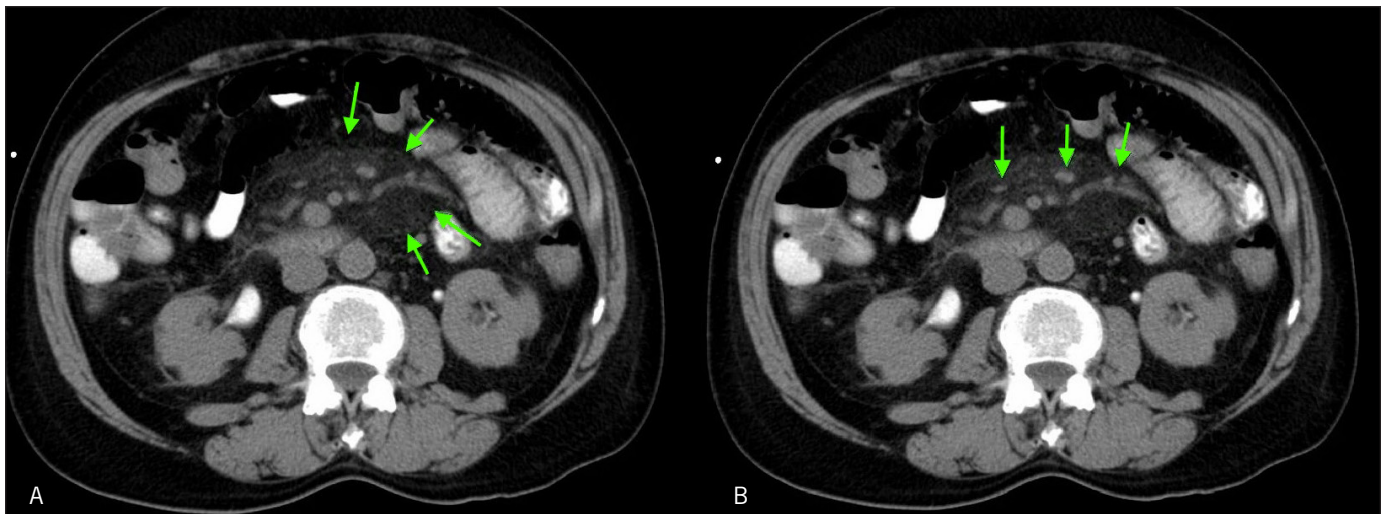


Figure 1. Initial CT with (A) mesenteric panniculitis and (B) mesenteric lymph nodes.

Due to persistent abdominal pain, vomiting and diarrhea, the patient had an abdominal CT scan on hospital day 2 that revealed prominent lymph nodes and a hazy mesentery consistent with MP (Figure 1). The patient was treated for presumed traveler's diarrhea with ciprofloxacin and metronidazole for 10 days, and was discharged on hospital day 3. Subsequently, his stool tested positive for pan-antibiotic susceptible *Vibrio cholerae*. The patient reported that his abdominal pain persisted for 1 month and diarrhea was present for 2 months. Follow-up CT 8 months after initial presentation indicated complete resolution of MP (Figure 2).

Discussion

MP is an inflammatory disorder of the mesentery with increasing prevalence as the number of abdominal CT scans has increased.² The clinical course, etiology, pathophysiology, and management of this condition is an area of ongoing study. MP has been associated with abdominal surgery or

trauma, pancreatitis, autoimmune diseases, and infiltration of the mesentery by a variety of malignancies including lymphoma and solid tumors (prostate, colorectal, breast, renal cell, lung, bladder).² Thickening of the mesentery may also be an epiphenomenon of cancer.¹⁷

An animal study demonstrated that immunization with *Vibrio cholerae* could yield mesenteric lymphadenopathy, and revealed that inoculated recipients formed *Vibrio cholerae* agglutinins in their mesenteric lymph nodes.¹⁵ Two studies also found that immunization with cholera caused increased antibody formation by mesenteric lymph nodes, resulting in inflammation,^{13,14} and that a systemic immune response preceded mesenteric lymph node response.¹⁸ Immunization with *Vibrio cholerae* lipopolysaccharide (LPS) and enterotoxin in rabbits showed increased IgM synthesis that was specific to the spleen and mesenteric lymph nodes compared to controls.¹⁹

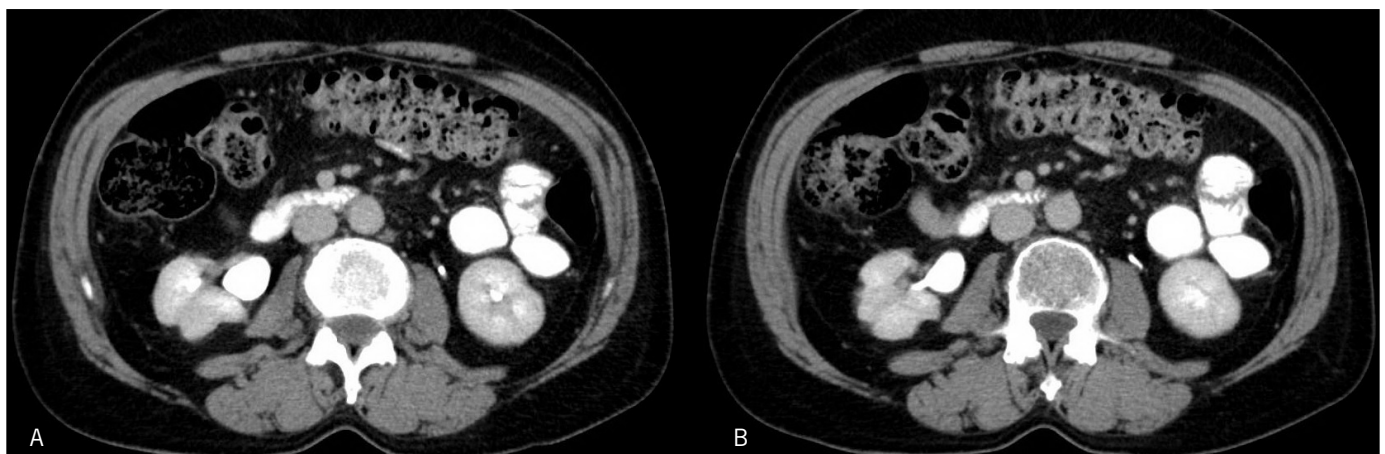


Figure 2. Follow-up CT with resolution of MP and regression of the mesenteric mass and mesenteric lymph nodes.

Antibiotic coverage of presumed traveler's diarrhea was provided by a fluoroquinolone, and metronidazole was given for protozoan coverage (*Entamoeba histolytica*). The results of the stool culture demonstrating *Vibrio cholerae* were only available 7 days after presentation. In the setting of *Vibrio cholerae*, the mainstay of treatment is rehydration. For patients with moderate to severe dehydration, antibiotics may be used for adjunctive therapy. Antibiotics may decrease the duration of symptoms, volume losses, and shedding of the infectious organism.²⁰

Cholera is endemic to countries with limited health resources, including CT scans. While MP-like findings on CT scans are rare, a few cases of infections causing mesenteric abnormalities on CT have been described, including *Mycobacterium tuberculosis*, *Staphylococcus aureus*, beta hemolytic *Streptococcus*, *Enterococcus*, *Clostridium*, and *Salmonella*.²¹ Viral infections that are associated with mesenteric lymphadenopathy include HIV, Epstein-Barr virus, Parvovirus, and chronic hepatitis B and C.²¹ Parasitic and fungal infections that are associated with mesenteric lymphadenopathy include *Strongyloides stercoralis* and *Cryptococcus*.²¹ The clinical course of the mesenteric lymphadenopathy varies widely, depending on progression of the underlying disease, and the standard descriptions of MP have not been noted in these cases. In addition, repeated imaging showing resolution of these findings following treatment for an infection has not been performed, making this an instructive case. Investigating the pathophysiology of acute mesenteric inflammation from an infectious cause may help to determine why some patients go on to develop the chronic inflammatory condition known as mesenteric panniculitis.

Disclosures

Author contributions: G. Roginsky reviewed the literature, wrote and revised manuscript, and is the article guarantor. A. Mazulis assisted with the literature review and revisions. JS Ecanow assisted with the radiographic analysis. ED Ehrenpreis assisted with review and revisions of the manuscript.

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