

CLINICAL VIGNETTE

The Way to a Young Man's Heart is Through His Bowels: A Case Report of Myopericarditis Associated with *C. jejuni* Enterocolitis

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Case Summary

A 32-year-old male with no significant past medical history presented to the Emergency Department with fevers, abdominal pain, and watery diarrhea for four days. He had a fever up to 104 degrees Fahrenheit at home and several loose bowel movements. He presented to the Emergency Department for further evaluation after developing bright red blood in his stools. He did not have nausea or vomiting. He recalled eating lobster bisque and salsa prior to the onset of symptoms. His uncle has ulcerative colitis. On arrival in the Emergency Department, the patient had a fever, was tachycardic, and had a leukocytosis of 16K. CT abdomen and pelvis showed pancolonic bowel wall thickening and loss of haustral markings, which were concerning for infectious or inflammatory bowel disease. He had an up-trending fever curve and was empirically started on ciprofloxacin and metronidazole on day 2.

On day 3, he underwent a flexible sigmoidoscopy. The colonic mucosa was diffusely edematous, erythematous, granular, and with total loss of the normal vascular pattern. Patchy hemorrhagic petechiae were seen as well as areas of patchy exudate. No ulceration or spontaneous bleeding was seen, though the mucosa was friable. These changes were in a circumferential and continuous fashion from the rectum to the proximal descending colon (Figures 1-4). Biopsies showed severe acute colitis with erosion and ulceration. There was minimal architectural disorder. Branched crypts and Paneth cell metaplasia, features typically seen with chronic disease, were absent. CMV stains were negative. Stool studies returned positive for campylobacter species. Patient was continued on ciprofloxacin with plan to treat for a total of 14 days for acute campylobacter colitis.

On day 4, the patient developed severe pleuritic chest pain and shortness of breath while resting. His pain improved with leaning forward and was worse when laying down. Electrocardiogram showed diffuse ST-segment elevations and his troponin was 11.9. Transthoracic echocardiogram showed normal ejection fraction of 55-60%, no pericardial effusion and no wall motion abnormalities. Given high suspicion for campylobacter myopericarditis, he underwent cardiac MRI, which showed abnormal delayed myocardial enhancement in the mid inferolateral wall and distal anterior wall and apex,

which was concerning for myocarditis. The patient had recurrent episodes of chest pain and an episode of non-sustained ventricular tachycardia. Subsequent electrocardiograms showed stable ST-segment elevations. Troponin peaked at 22.5 and fluctuated, consistent with myopericarditis. He was started on colchicine, metoprolol succinate, and benazepril. Following discharge, he was closely followed by cardiology and gastroenterology clinics and had full recovery without further symptoms.

Discussion

Campylobacter infection is a common cause of diarrhea. Campylobacter enteritis is typically caused by *C. jejuni* or *C. coli*. The organism can inhabit the intestinal tracts of animal hosts, most commonly poultry, and can infect water sources. Contamination from these sources ultimately leads to disease with a spectrum of clinical manifestations.¹

Campylobacter enteritis can be difficult to distinguish from other bacterial pathogens such as Salmonella or Shigella. The mean incubation period is three days. Early symptoms include severe abdominal pain and diarrhea. Patients frequently report ten or more bowel movements per day with 15% presenting with bloody diarrhea. The abdominal pain may also occur without diarrhea and may mimic appendicitis. Diarrhea is self-limited and lasts for a mean of seven days.

Campylobacter infection typically starts in the jejunum and ileum and progresses distally to the cecum and the colon. The acute presentation of acute abdominal pain, colitis, and bloody diarrhea mimics that of inflammatory bowel disease (IBD) clinically, radiographically, and endoscopically.^{2,3} However, histologic examination of the colonic mucosa in patients with Campylobacter colitis demonstrates acute inflammation without the chronic changes and crypt architectural distortion usually seen with IBD.

Diagnosis is made by stool culture. Because infection is usually mild and self-limited, antibiotics are not needed for most cases. Antibiotics are indicated for those with severe disease (bloody diarrhea, high fever, extraintestinal manifestations, symptoms lasting more than one week), or those who are at risk for severe disease such as elderly, pregnant, and immunocompromised

patients. First line agents include fluoroquinolones or azithromycin. Complications of Campylobacter enteritis include cholecystitis, peritonitis, rash, septic pseudoaneurysm, pericarditis, myocarditis, reactive arthritis, and Guillain-Barre syndrome.

Myocarditis is an inflammatory condition of the myocardium characterized on biopsy by an inflammatory infiltrate with myocyte necrosis. There are multiple potential causes of myocarditis (Table 1). Typical symptoms include fatigue, chest pain, and shortness of breath. Patients may present with arrhythmias, congestive heart failure, and sudden death. Clinical findings are variable. Patients with associated myocardial dysfunction will present with signs and symptoms referable to congestive heart failure, including rales, S3 and S4 heart sounds. The ECG may include new conduction abnormalities, atrial and/or ventricular arrhythmias, ST-T wave changes, and Q-waves. During the acute or subacute phase of the disease, troponin is likely to be elevated, whereas the troponin may be normal during the chronic phase. Echocardiography may demonstrate normal wall motion, regional or global wall motion abnormalities. MRI typically demonstrates patchy late-gadolinium enhancement of the epicardium and mid myocardium, sparing the endocardium. Endomyocardial biopsy can be used to confirm the diagnosis of a primary myocarditis. The clinical course may range from subclinical inflammation of the myocardium to fulminant heart failure progressing to death within two weeks. Patients with subclinical inflammation may present subsequently with dilated cardiomyopathy. In fulminant myocarditis, there is normal left ventricular size with severe left ventricular systolic dysfunction.

C. jejuni is a frequent cause of human bacterial enteritis.⁴ We present a case of acute myocarditis in relation to *C. jejuni*. Indeed, there are several extra-intestinal manifestations of *C. jejuni* (Table 2),⁵ either as a result of direct infection or as immune-mediated response to *C. jejuni* infection. Similar to the patient described above, this condition tends to affect young men and appears to have a benign course,⁶ although a case of ventricular tachycardia and severe left ventricular systolic dysfunction has been reported.⁷ Besides treatment of the underlying *C. jejuni* infection, hormonal blockade with angiotensin-converting enzyme inhibitors and cardioprotective beta-blockers should be considered, in accordance with standard treatment for myocarditis. Furthermore, consideration should be given to exercise restriction, given that exercise in the setting of myocarditis is associated with sudden death.

Conclusion

C. jejuni is associated with myocarditis. In patients with *C. jejuni* enteritis with symptoms of chest pain, shortness of breath or palpitations, evaluation for myocarditis is warranted. In cases of *C. jejuni* associated myocarditis, standard treatment for myocarditis is warranted.

Tables and Figures

Table 1. Causes of Myocarditis

Primary Myocarditis	
• Giant cell myocarditis	• Eosinophilic myocarditis
Infectious or Post-Infectious Myocarditis	
• Primary viral myocarditis	• Lyme Disease
• Adenovirus	• Post-Infectious
• Enterovirus	• Post-Viral
• Herpes Virus C	• <i>C. jejuni</i>
• Parvovirus B19	• Salmonella enteritis
• Hepatitis C	• Rheumatic myocarditis
• HIV	• Chagas disease
Secondary to Autoimmune Condition	
• Sarcoidosis	• Rheumatoid arthritis
• Systemic lupus erythematosus	• HLA-associated
Drug-Related	
• Clozapine	• Chemotherapeutic agents

Table 2. Extra-Intestinal Manifestations of *C. jejuni*.

Extra-Intestinal Manifestations of <i>C. jejuni</i>	
• Guillain-Barre Syndrome	• Cardiovascular
• Reactive Arthritis	◦ Myocarditis
• Dermatologic	◦ Pericarditis
• Vasculitis	◦ Septic Pseudoaneurysm
• Cellulitis	◦ Atrial Fibrillation
• Urticaria	• Ocular
• Erythema Nodosum	◦ Conjunctivitis
	◦ Anterior Uveitis

Figures 1-3. Diffuse edema, erythema, granularity, scattered petechiae and loss of vascular pattern. **Figure 4.** Diffuse edema and patchy exudate.

Figure 1.

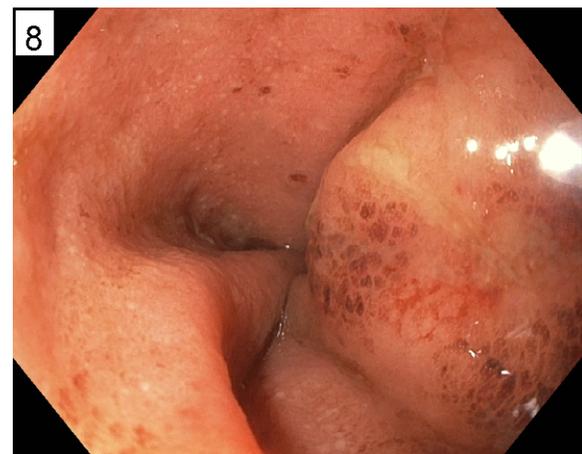


Figure 2.



Figure 3.

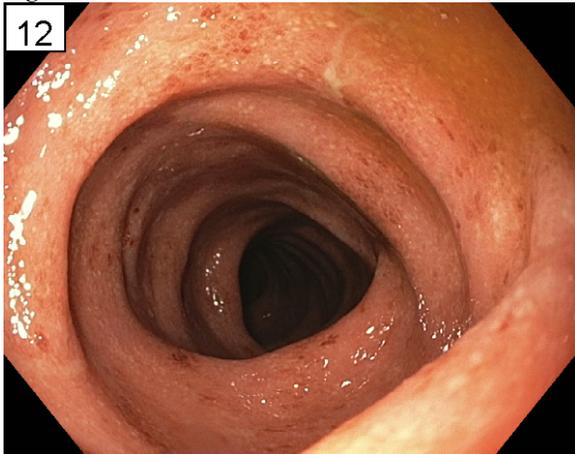
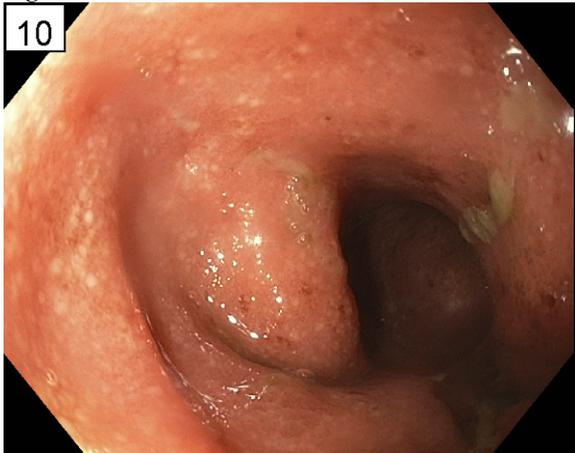


Figure 4.



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