



Cytomegalovirus-Related Gastritis in an Immunocompetent Host Presenting With Infectious Gastroparesis

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ABSTRACT

Cytomegalovirus (CMV) infection is usually asymptomatic or causes a mild mononucleosis-like syndrome, whereas severe symptoms are rarely reported. We report a case of a 70-year-old woman who was admitted to our center because of severe clinical presentation with anorexia, epigastric pain, nausea, postprandial vomiting, and significant weight loss. Esophagogastroduodenoscopy with biopsies showed ulcerative chronic gastritis with scattered large cells with inclusion bodies. Immunohistochemistry and polymerase chain reaction for CMV-DNA resulted positive. A gastric emptying of solid scintigraphy showed severe gastroparesis. The patient was discharged after 2 months of antiviral therapy completely asymptomatic. To the best of our knowledge, this is the first case of CMV-related gastroparesis in an immunocompetent patient, successfully treated with antiviral therapy.

KEYWORDS: *Cytomegalovirus* (CMV); gastritis; gastroparesis; immunocompetent

INTRODUCTION

Cytomegalovirus (CMV) is the member of the Herpesviridae family with a serology prevalence ranging from 45% to 100% worldwide.¹ The primary infection commonly occurs in childhood or early adolescence. After the acute infection, CMV remains silent, keeping its ability to reactivate in case of host's impaired immune function. The infection is usually asymptomatic or causes a mild mononucleosis-like syndrome,² whereas in immunocompromised patients, a severe and life-threatening disease may occur. Gastrointestinal disease associated with CMV infection can involve the entire alimentary tract,³ and a minority of patients may develop an autonomic neuropathy with gastroparesis.⁴ Antiviral therapy is recommended for severe infections in immunocompromised patients, whereas treatment in immunocompetent individuals is still debated.^{3,5,6}

CASE REPORT

A 70-year-old White woman was admitted to our Academic Medical Center for anorexia, epigastric pain, dyspepsia, nausea, postprandial vomiting, and weight loss (20 kg) in the past 3 months. Her medical history included essential hypertension, mitral valve prolapse, and surgically treated pulmonary cyst.

The initial esophagogastroduodenoscopy showed a granular mucosa and white spots in the gastric body and fundus, with histological examination resulting in chronic *Helicobacter pylori*-negative gastritis with scattered eosinophils in the lamina propria. Because

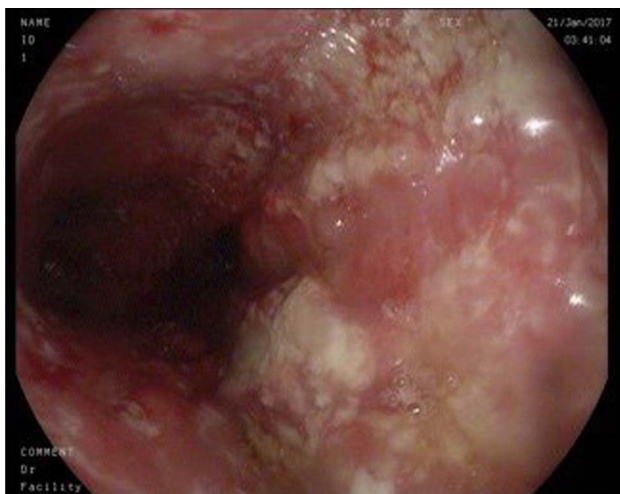


Figure 1. Endoscopic appearance of the gastric body.

nausea and vomiting did not improve, despite intravenous antiemetics and exclusion of medications potentially responsible for emesis, the patient was hospitalized and parenteral nutrition was started.

The transabdominal ultrasound was normal, and colonoscopy showed sigmoid diverticulosis. Laboratory tests revealed pancytopenia and elevated C-reactive protein (23.60 mg/L, reference range 0–5). Serology for *Brucella*, *Coxiella burnetii*, *Leptospira*, hepatitis B and C, human immunodeficiency virus, and stool *Clostridioides difficile* toxin assay was all negative. Rheumatic diseases, malignancy, lymphoma, and immune disorders were excluded. A positron emission tomography showed an abnormal tracer concentration in the stomach and in the first portion of the duodenum as a result of an acute inflammation. Repeat esophagogastroduodenoscopy (Figures 1 and 2) and small bowel enteroscopy revealed a congested mucosa with discrete ulcerative lesions with and without exudate, mainly in the antrum and distal gastric body, whereas erythema was found in the proximal and the

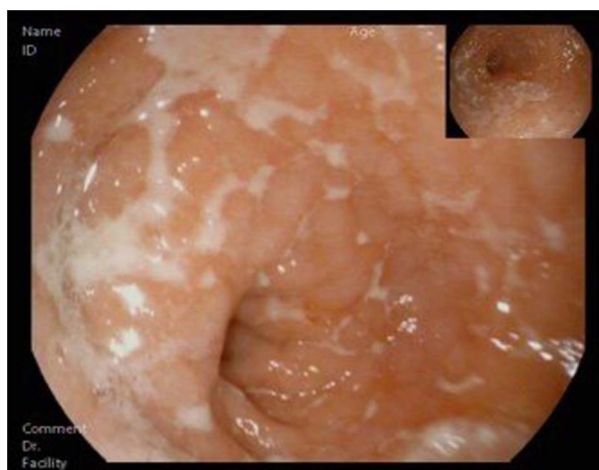


Figure 2. Endoscopic appearance of the gastric antrum.

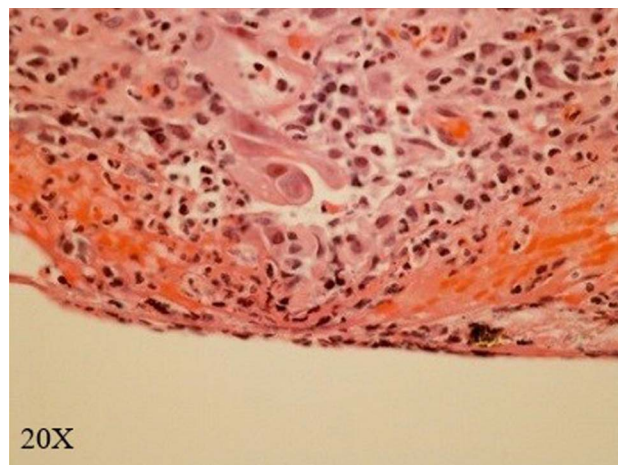


Figure 3. Histological findings, representative image of the inclusion by *Cytomegalovirus*, called "owl's" eye in standard hematoxylin and eosin staining (20× field).

middle portion of the gastric body and duodenal bulb. Histology was consistent with severe ulcerative chronic gastritis, duodenitis, and scattered large cells with inclusion bodies were observed, which was typical for CMV-related infection (Figure 3). Immunohistochemistry using monoclonal CMV antibodies (Figure 4) and polymerase chain reaction (PCR) for CMV-DNA in plasma was positive (28,278 IU/mL). A gastric emptying of solid scintigraphy showed a severe gastroparesis with a half gastric emptying time of 155 minutes. The patient was started with intravenous ganciclovir 5 mg/kg twice daily, and prompt improvement of symptoms and pancytopenia in a few days was noted. Because pancytopenia was worsening again requiring white blood cell growth factors and platelet transfusion, ganciclovir was discontinued. A month later, EGD showed significant improvements of the mucosal injury (Figure 5). However, the histological examination detected a subatrophic chronic CMV-positive gastritis

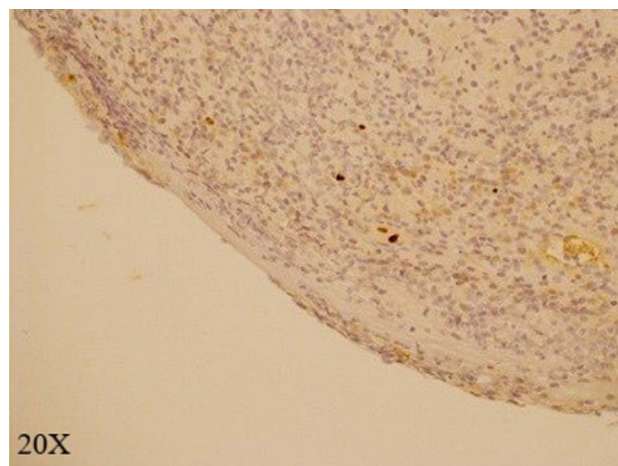


Figure 4. Immunohistochemistry findings, representative image of the inclusion by *Cytomegalovirus*, with immunohistochemical staining (20× field).

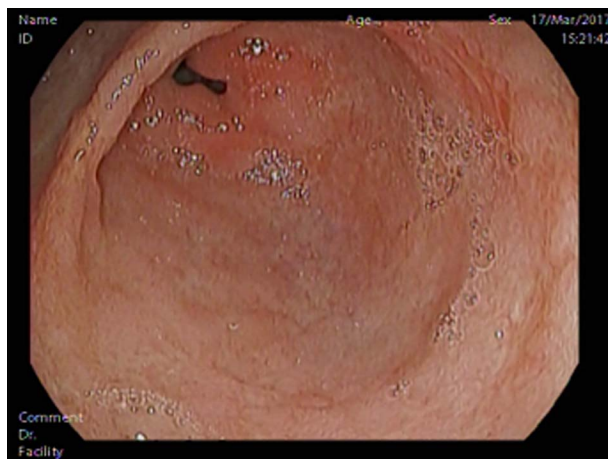


Figure 5. Endoscopic appearance of the gastric antrum 2 months after the antiviral therapy.

with PCR for plasma CMV-DNA still positive (19,108 IU/mL). Considering the persistent CMV infection, oral valganciclovir 450 mg twice daily was started for 2 cycles of 3 weeks each until PCR test was negative. A second gastric emptying of solid scintigraphy was performed showing regular gastric emptying. The patient was discharged after 2 months completely asymptomatic without residual feeding issues.

DISCUSSION

Gastrointestinal disease associated with CMV infection can involve the entire alimentary tract,³ with colitis⁷ and esophagitis⁸ being the most common clinical manifestations. A minority of patients may develop an autonomic neuropathy, including gastroparesis that usually improves in a year, but sometimes, symptoms can persist for years with a worse prognosis.⁴ We report a rare case of CMV

Table 1. Summary of the published data from previous cases of gastric *Cytomegalovirus* disease in immunocompetent patients

Study	Age (y)	Sex	History	Symptoms	Endoscopic findings	Histological findings	Treatment	Follow-up endoscopy
Crespo et al ⁹	31	M	None	Epigastric pain and fever	Superficial erosions of the gastric antrum	Inclusion bodies and positive IHC staining	IV ganciclovir 5 mg/kg twice daily for 7 d	Full resolution, time of repeated endoscopy is not mentioned
Fyock et al ¹⁰	83	M	Diabetes mellitus	Melena	Gastritis with multiple small antral, duodenal, and colonic ulcers	Inclusion bodies and positive IHC staining culture and PCR	21-day course of oral ganciclovir followed by IV administration	Partial healing of the duodenal ulcers after the antiviral therapy; full resolution 4 y later with the persistence of CMV
Ebisutani et al ¹¹	33	M	None	Epigastric pain, low-grade fever, and cough	Multiple gastric papules and a large irregularly shaped shallow ulcer	Positive IHC staining in the absence of inclusion bodies	Oral PPI (rabeprazole, 20 mg/day)	Small gastric ulcer on day 40; a residual ulcer scar on day 68
Matsui et al ¹²	29	M	N/A	Epigastric pain and fever	Multiple shallow gastric ulcers and mucosal erosions	Positive PCR for CMV-DNA in the absence of inclusion bodies	Oral PPI	Full resolution 2 mo later
Himoto et al ¹³	31	M	None	Epigastric pain and fever	Multiple shallow gastric ulcers and mucosal edema	Inclusion bodies and positive IHC staining	Oral PPI (lansoprazole, 30 mg/day)	Full resolution 2 mo later
Xiong et al ¹⁴	44	M	None	Epigastric pain and abdominal distention	Multiple erosions in the gastric antrum and thickening of the stomach wall	Inclusion bodies and positive IHC staining negative PCR for CMV-DNA	IV ganciclovir for 3 mo	Full resolution 3 mo later
Yamamoto et al ¹⁵	35	M	None	Infectious mononucleosis syndrome	Thickened and eroded mucosa throughout the stomach	Positive IHC staining in the absence of inclusion bodies	None	Improvement, time of repeated endoscopy is not mentioned
Beany and Rainis ¹⁶	66	M	None	Nausea, vomiting, weakness, night sweats, anorexia, and diarrhea	Large, irregularly shaped, deep ulcer in the gastric antrum and mucosal gastric erosions	Inclusion bodies and positive IHC staining positive PCR for CMV-DNA	Oral PPI (esomeprazole 40 mg/day)	Full resolution 2 mo later
Current report	70	F	Hypertension	Anorexia, epigastric pain, dyspepsia, nausea, postprandial vomiting, and weight loss	Gastric congestion and mucosal erosions	Inclusion bodies and positive IHC staining positive PCR for CMV-DNA	IV ganciclovir 5 mg/kg twice daily for 7 d + oral valganciclovir 450 mg twice daily for 2 cycles of 3 weeks each	Full resolution 2 mo later

CMV, *Cytomegalovirus*; EGD, esophagogastrroduodenoscopy; IHC, immunohistochemistry; IV, intravenous; PCR, polymerase chain reaction; PPI, proton pump inhibitors.

gastritis with associated gastroparesis in an immunocompetent patient.

After PubMed research for case reports up to September 2023 (keywords: *Cytomegalovirus* AND immunocompetent AND gastric ulcer OR gastritis), of the 26 search results, we found 8 English articles on CMV gastric disease in immunocompetent adults eligible for inclusion (Table 1). Unlike to the case we report, all patients were male,^{9–16} and most of them were young adults with no underlying diseases. Similar to our case, CMV infection of the upper GI tract in immunocompetent hosts has been reported to cause multiple gastric erosions and ulcers similar to *H. pylori*- and nonsteroidal anti-inflammatory drugs-related ulcers.¹³

In a systematic review, Rafailidis et al³ reported 290 cases of severe CMV infection in immunocompetent adults concluding that the incidence of severe manifestations of CMV infection in immunocompetent individuals may not be as rare as previously believed. CMV infection is generally treated with inhibitors of viral DNA polymerase such as ganciclovir or foscarnet, which may have many side effects (eg, nephrotoxicity, myelotoxicity, neurotoxicity, and hepatotoxicity); thus, their use is usually recommended for immunocompromised patients.^{3,5,10} Immunocompetent individuals often do not need antiviral treatment; however, in case of severe clinical manifestations, they have been considered by some authors who reported favorable results in terms of clinical improvement.^{5,17–19}

A meta-analysis of CMV colitis in immunocompetent hosts²⁰ showed that mortality rate was higher in males, patients with chronic diseases, and older than 55 years. Based on this, they suggested the use of antiviral therapy in these patient groups rather than in immunocompromised ones. Therefore, current data suggest antiviral therapy as appropriate for severe CMV disease in immunocompetent hosts.

Cytomegalovirus infection may present with severe gastritis and gastroparesis; therefore, endoscopy with biopsies is crucial diagnostic method as it was in this case. The antiviral therapy should be considered even in immunocompetent patients balancing the benefit/risk ratio case by case.

DISCLOSURES

Authors contributions: S. Solito, S. Battista, and M. Marino were directly responsible for the patient and managed the whole clinical case. S. Solito, G. Tomassini, M. Bulajic, N. Panic, K. Jankovic, and SF Vadalá di Prampero were major contributors in writing of the manuscript, and all authors read and approved the final manuscript.

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