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CASE REPORT | STOMACH

Clinical and Pathologic Response to Vedolizumab in a Young Female Patient With Collagenous Gastritis

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ABSTRACT

Collagenous gastritis is a rare form of gastritis that affects both children and adults. The underlying pathophysiology is not well-understood, and as a result, there are limited options for treatment. We report a case of a young female patient with chronic diffuse abdominal pain, nausea, regurgitation, and early satiety with esophagogastroduodenoscopy showing gastric erythema, atrophic gastric body, and significant gastric nodularity. Biopsies revealed focal erosion and increased subepithelial collagen deposition. She was successfully managed with intravenous vedolizumab infusions after initial therapy with topical budesonide did not result in clinical or endoscopic improvement.

KEYWORDS: vedolizumab; collagenous gastritis; gastritis; subepithelial collagen

INTRODUCTION

Collagenous gastritis is a rare disorder grouped among collagenous gastroenteritis, which also includes collagenous sprue and collagenous colitis. Clinical presentations vary with age and site of involvement but include abdominal pain, nausea, vomiting, chronic diarrhea, and anemia.[1] We successfully treated a young female patient with refractory symptoms and biopsy-proven collagenous gastritis with intravenous vedolizumab infusions.

CASE REPORT

A 20-year-old White woman presented to gastroenterology clinic with chronic and diffuse abdominal pain, nausea, regurgitation, and early satiety. Her medical history was significant for allergic rhinitis, gastroesophageal reflux disease, migraines, and iron deficiency anemia. Medications included esomeprazole, hyoscyamine, rizatriptan, gabapentin, acetaminophen, and amitriptyline. There was no reported history of chronic pediatric disorders. Family history revealed that her grandmother had similar gastrointestinal symptoms, but no confirmed diagnosis. Physical examination was significant for diffuse abdominal pain to deep palpation, otherwise unremarkable. Initial workup, including complete blood count, basic metabolic panel, inflammatory markers, thyroid-stimulating hormone, and liver function tests, was normal (Table 1). Workup for celiac disease, including tissue transglutaminase and deaminated gliadin antibodies, was negative (Table 1).

Initial esophagogastroduodenoscopy (EGD) performed at our facility revealed significant gastric nodularity, erythema, and nodularity (Figure 1). The esophagus showed normal-appearing mucosa. Narrow-band imaging during EGD highlighted the contrast between the nodular areas representing normal tissue architecture and the depressive mucosal lesions seen in between the nodular lesions (Figure 2). Initial histopathology of the gastric body showed subepithelial collagen deposition > 10 μM in thickness; sloughing of the overlying surface epithelium; loss of specialized gastric glands; and an inflammatory infiltrate consisting of eosinophils, plasma cells, and lymphocytes (Figure 3). Trichrome stain highlighted the characteristic collagen deposition (Figure 4). At this point, the patient was on topical budesonide 9 mg daily, which she stopped after 2 weeks because of no significant improvement in symptoms. Repeat EGD did not reveal any improvement in gastric body nodularity or subepithelial collagen deposition on biopsy.

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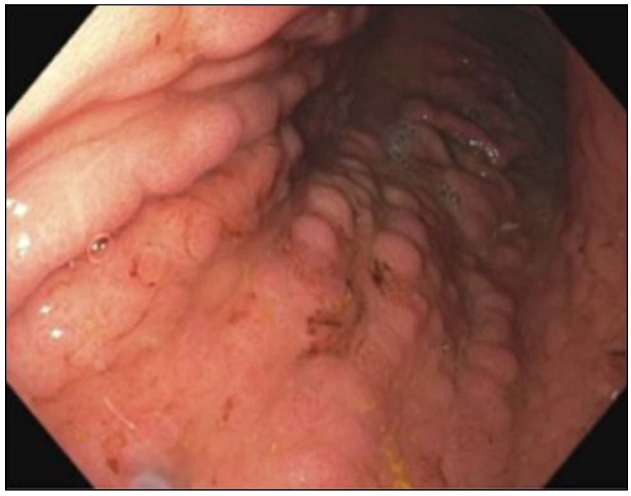

Figure 1. Gastric body with nodularity and multiple biopsy sites.

Owing to persistent symptoms and lack of significant resolution on endoscopy, the patient was transitioned to intravenous (IV) vedolizumab infusions with a loading dose of 300 mg at 0, 2, and 6 weeks, followed by maintenance dosing at 300 mg every 8 weeks. The patient reported steady improvement in abdominal pain, nausea, and vomiting 2 weeks after the loading doses and was monitored for symptoms every 6 months for the first year while on therapy. No other medications, including budesonide or systemic oral steroids, were given while on IV vedolizumab. Follow-up EGD 7 months after initiation of IV vedolizumab revealed significant improvement in histopathology with healthy surface foveolar cells and return of specialized gastric glands with few plasma cells in the lamina propria (Figure 5). Despite the biopsy results showing significant improvements in the gastric body architecture, the collagenous deposition remained largely unchanged and endoscopic evaluation revealed persistent gastric nodularity. The patient was continued on intravenous vedolizumab infusions every 8 weeks as maintenance therapy thereafter.

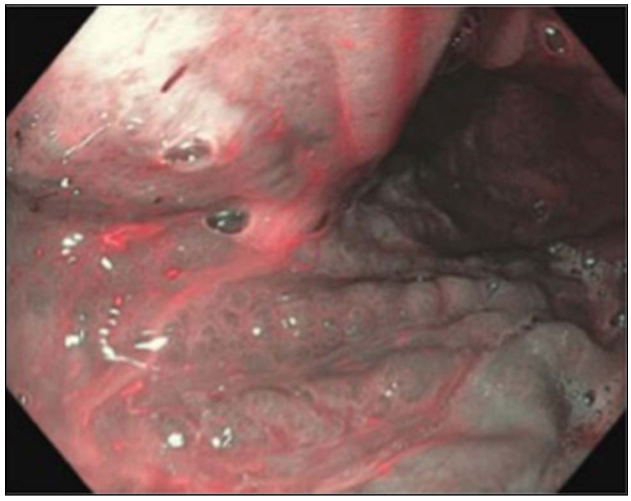

Figure 2. Narrow-band imaging of the gastric body with a nodular pattern.

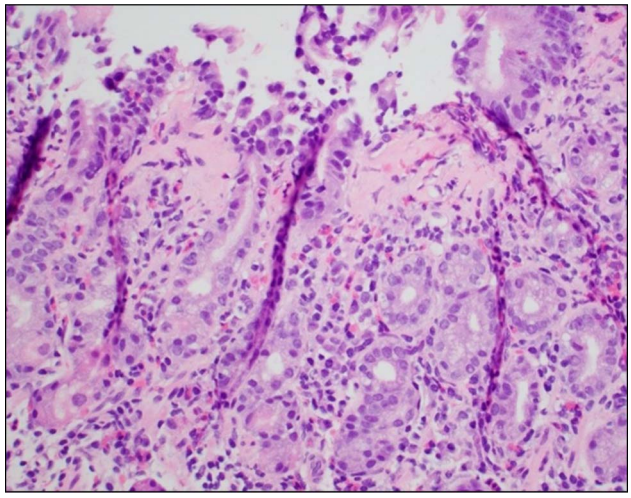

Figure 3. Initial histopathology of the gastric body showing subepithelial collagen deposition >10 μM in thickness with sloughing of the surface epithelium; loss of specialized gastric glands; and an inflammatory infiltrate of eosinophils, plasma cells, and lymphocytes. 40× original magnification.

DISCUSSION

The first case of collagenous gastritis was described in 1989 in a 15-year-old adolescent girl who presented with chronic gastritis.[2] The hallmark characteristic of subepithelial type III collagen deposition was previously reported in the small intestine and colon, but not in the stomach.[2] Since 1989, over 60 cases of collagenous gastritis have been reported.[1] Endoscopically, the characteristic nodular appearance of the gastric antrum is caused by intervening areas of depressed mucosa, which have glandular atrophy and collagen deposition.[3] This was corroborated by narrow-band imaging studies by Kobayashi et al who showed that the mucosal surface of the nodular lesions did not show

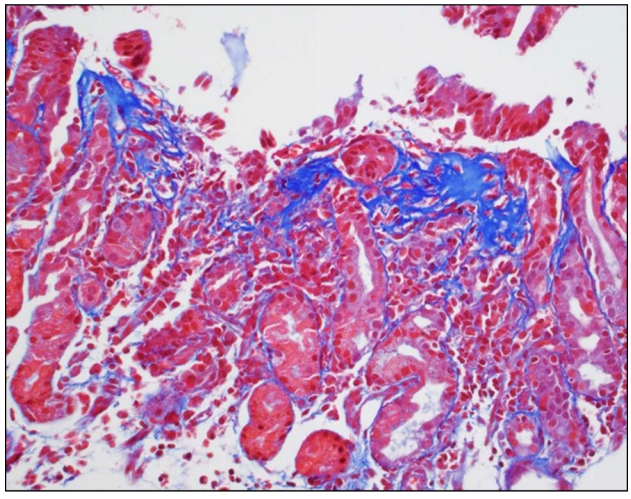

Figure 4. Initial histopathology of the gastric body showing an increase in subepithelial collagen; some loss of specialized gastric glands; and an inflammatory infiltrate of eosinophils, plasma cells, and lymphocytes. Trichrome stain for collagen highlights the increased subepithelial collagen. 40× original magnification.

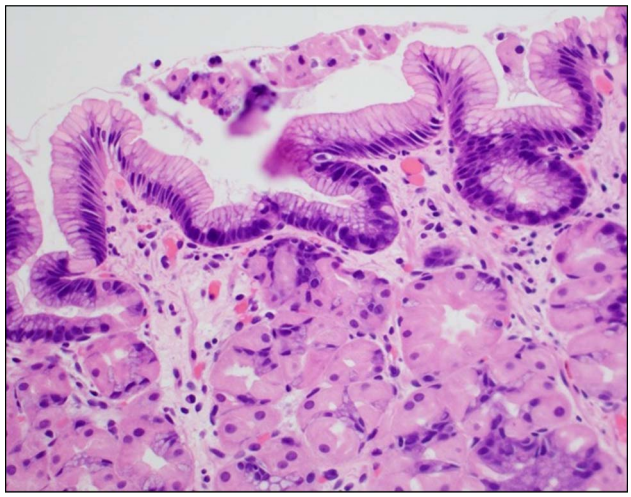

Figure 5. Histopathology of the gastric body after treatment with IV vedolizumab showing healthy surface foveolar cells and specialized gastric glands, few plasma cells within the lamina propia, and no increase in subepithelial collagen. 40× original magnification.

marked changes or abnormal capillary vessels.[4] Histologically, collagenous gastritis is characterized by heterogeneous subepithelial surface collagen deposition generally between 10 and 100 μM in thickness with an associated inflammatory infiltrate in the lamina propria.[5] Interestingly, collagen deposition in the colon seen with collagenous colitis appears more uniform.[1] It is postulated that the thickness of the collagen deposition is directly related to the chronicity of the disease.[3] Furthermore, deposition of type III collagen from subepithelial fibroblasts is a reparative response to the inflammatory environment and consequently may not reverse quickly despite reducing inflammation.[6] The inflammatory infiltrate consists of plasma cells, eosinophils, and lymphocytes, which suggests a possible autoimmune pathophysiology. Furthermore, studies have revealed a predisposition to autoimmune-related conditions in children with collagenous gastritis.[7] Despite this, the exact etiology and pathogenesis of this disorder is still not well-understood. Our patient exhibited the characteristic histopathologic findings, which confirmed the diagnosis of collagenous gastritis.

Clinical presentation of collagenous gastritis varies between pediatric and adult populations with some overlap in symptoms.[8] Arnason et al reported a multi-institutional series of patients which included 40 patients with collagenous gastritis, in which pediatric patients presented with abdominal pain, anemia, nausea, and vomiting, whereas adult patients presented with anemia, diarrhea, and abdominal pain.[5,9] This is consistent with the symptomatology of our patient.

The initial treatment modalities for collagenous gastritis consist of proton-pump inhibitors, H2-receptor antagonists, topical budesonide, and iron supplementation, all of which have varying efficacies.[1,6] It is difficult to implement a standardized treatment protocol for collagenous gastritis given the variability in symptoms between children and adults and the lack of strong randomized controlled trial data. Choung et al reported considerable efficacy using a retrospective analysis of patients with collagenous gastritis treated with topical budesonide.[10] This is likely due to the anti-inflammatory and immunomodulatory effects of steroids, which help reduce the inflammatory milieu seen on histology with collagenous gastritis. Vedolizumab is a monoclonal antibody against α4β7-integrin and is commonly used in inflammatory bowel disease. Binding to the α4β7-integrin prevents adhesion to its ligand, MAdCAM-1, which prevents T-cell adhesion.[11] An advantage of vedolizumab compared with other biologic therapies for inflammatory bowel disease is its gut-specific anti-inflammatory activity that reduces the likelihood of infection from systemic immunosuppression. Vedolizumab improves clinical symptoms and disease remission in cases of refractory microscopic colitis, which has 2 main subtypes—collagenous

Table 1. Initial workup summary

Laboratory finding	Before vedolizumab[a]
Sodium (mmol/L)	142
Potassium (mmol/L)	4.5
Chloride (mmol/L)	105
Bicarbonate (mmol/L)	23
Blood urea nitrogen (mg/dL)	10
Creatinine (mg/dL)	0.92
Glucose (mg/dL)	113
Albumin (g/dL)	4.5
Total protein (g/dL)	6.4
Calcium (mg/dL)	10.0
Magnesium (mg/dL)	2.1
Alkaline phosphatase (unit/L)	55
Total bilirubin (mg/dL)	0.2
AST/SGOT (unit/L)	14
ALT/SGPT (unit/L)	19
White blood cell count ($10^3/\mu L$)	5.7
Hemoglobin (g/dL)	13.3
Hematocrit (%)	39
Mean corpuscular volume (fL)	91
Platelet count ($10^3/\mu L$)	235
T-Transglutaminase IgA (unit/L)	<1
Deaminated gliadin antibodies, IgA (unit/L)	<1
T-Transglutaminase IgG (unit/L)	<1
Deaminated gliadin antibodies, IgG (unit/L)	12
Erythrocyte sedimentation rate (mm/hr)	<3
C-reactive protein (mg/dL)	<0.30
Thyroid-stimulating hormone (mIU/L)	1.8

ALT, alanine aminotransferase; AST, aspartate aminotransferase; IgA, immunoglobulin A; IgG, immunoglobulin G; SGOT, serum glutamic-oxaloacetic transaminase; SGPT, serum glutamic-pyruvic transaminase.
[a]All laboratory tests were obtained before starting vedolizumab therapy.

colitis and lymphocytic colitis.[11] Although the exact pathophysiology of collagenous gastritis is not well-understood, it is possible that the immunomodulatory effects of vedolizumab, particularly its role in T-cell function, can result in clinical and histopathologic improvement. This case highlights a potential novel therapy for cases of refractory collagenous gastritis, which may lead to further studies preferably in a randomized controlled setting.

DISCLOSURES

Author contributions: P. Patel wrote the abstract and manuscript and is the article guarantor. P. Sanvanson provided the endoscopic images. S. Doucette provided the histopathology images.

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Previous presentation: This case was presented as a poster at the American College of Gastroenterology Annual Scientific Meeting; October 21-26, 2022; Charlotte, North Carolina.

Informed consent was obtained for this case report.

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