ACG CASE REPORTS JOURNAL

CASE REPORT | FUNCTIONAL GI DISORDERS

Gastrointestinal Hemorrhage and Diffuse Bowel Dilation in Huntington Disease

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ABSTRACT

Huntington disease (HD) is a neurodegenerative condition associated with pathologic involvement beyond the striatum including involvement of the autonomic nervous system. Bowel dysfunction is found in patients with HD, but the exact mechanism is poorly understood and not well reported. Patients may be affected with problems such as dysphagia, weight loss, nutritional deficiencies, esophagitis, and gastritis. Lower bowel symptoms are more prevalent with longer disease course. We present a case of a patient with late-stage HD who presents with severe esophagitis causing gastrointestinal hemorrhage, significant dysmotility including chronic dysphagia requiring gastrostomy tube, and chronic small bowel and colonic ileus.

KEYWORDS: constipation; dilation; dysmotility; dysphagia; upper gastrointestinal bleeding

INTRODUCTION

Huntington disease (HD) is a progressive neurodegenerative condition inherited in the autosomal dominant pattern.[1] It results from unstable trinucleotide (cytosine, adenine, guanine [CAG]) repeats within the *huntingtin* gene and often presents in middle adulthood, with increased length of CAG expansion strongly correlated with earlier age of clinical presentation.[2,3] HD is classically characterized by symptoms of involuntary movements and cognitive and behavioral disturbances; however, HD may progress, resulting in dysphagia, dysarthria, slowed muscular movements, and dementia.[4] Individuals with HD also report bladder incontinence and gastrointestinal dysfunction, although the pathophysiology is not well defined or reported.[5,6] We present a case of upper gastrointestinal inflammation revealing marked bowel dilation in a patient with HD.

CASE REPORT

A 61-year-old man with a history of HD with functional quadriplegia and dysphagia requiring a gastrojejunostomy tube, as well as diabetes insipidus, depression, gastroesophageal reflux disease, and hypertension, presented to the hospital with 1 day of melena. History was limited because the patient was nonverbal; however, his caretaker noted that he was having black-tarry stools and coffee-ground emesis.

The patient was diagnosed with HD 15 years ago after experiencing sentinel symptoms of depression, followed by choreiform movements. A computed tomography (CT) of the head from 2010 demonstrated atrophy of the ventricles and sulci out of proportion to his age. This progressed to dysphagia, weight loss, and recurrent aspiration, diagnosed with barium swallow. He required gastrostomy tube placement in 2016, subsequently exchanged for a gastrojejunostomy tube because of high gastric residuals. By 2019, he experienced marked cognitive decline, complete quadriplegia, and was nonverbal because of muscular weakness. His disease course was complicated by intermittent constipation treated with polyethylene glycol and docusate and gastroesophageal reflux sporadically treated with proton pump inhibitors (PPI). Multiple previous abdominal imaging demonstrated colonic dilation, although this was never further investigated.

The patient first presented 2 weeks earlier with symptoms of diarrhea and coffee-ground emesis. CT of the abdomen/pelvis at this time showed a distended fluid-filled stomach and distal esophagus and significant fecal burden throughout the colon and rectum

ACG Case Rep J 2024;11:e01255. doi:10.14309/crj.0000000000001255. Published online: January 4, 2024

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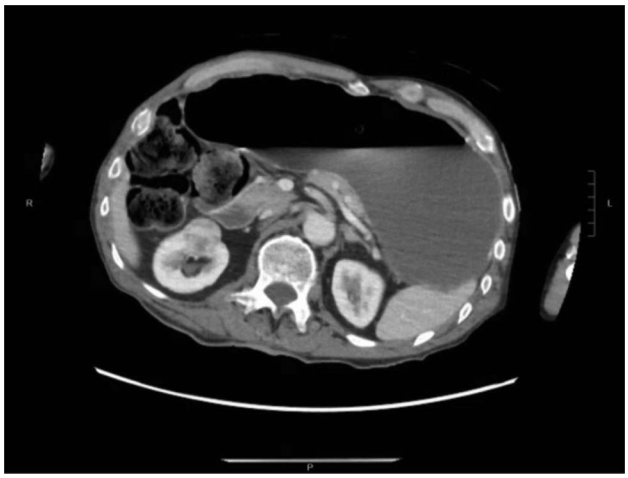

Figure 1. Computed tomography of the abdomen revealing markedly distended and fluid filled stomach.

(Figures 1 and 2). A nasogastric tube was placed for decompression, with minimal output, and he underwent fecal disimpaction. During this admission, he had a hemoglobin drop from 14.2 to 11.7 g/dL. He underwent esophagogastroduodenoscopy

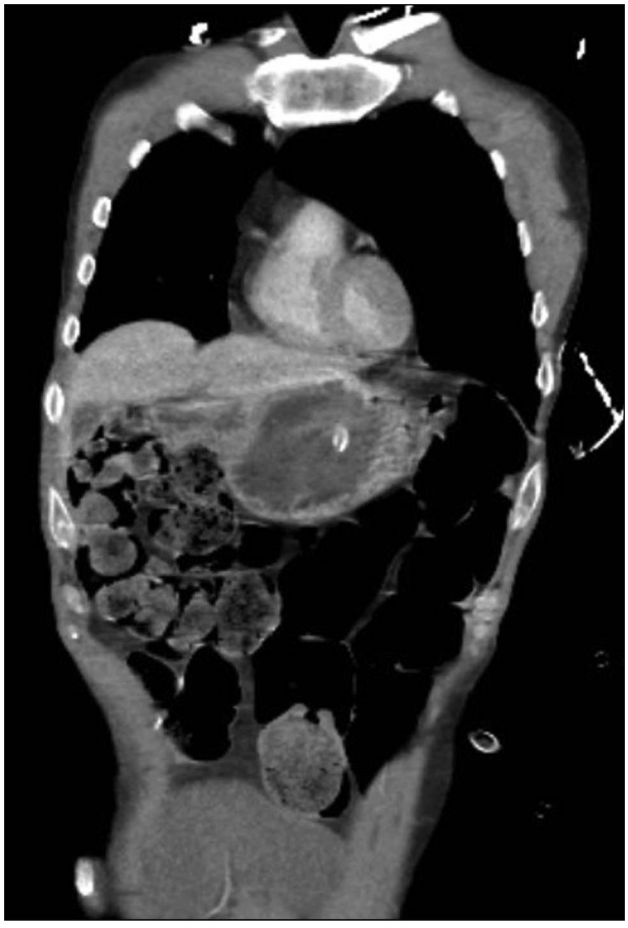

Figure 2. Computed tomography of the abdomen revealing a moderate to large amount of stool in the colon. The bowel is diffusely dilated but no evidence of obstruction.

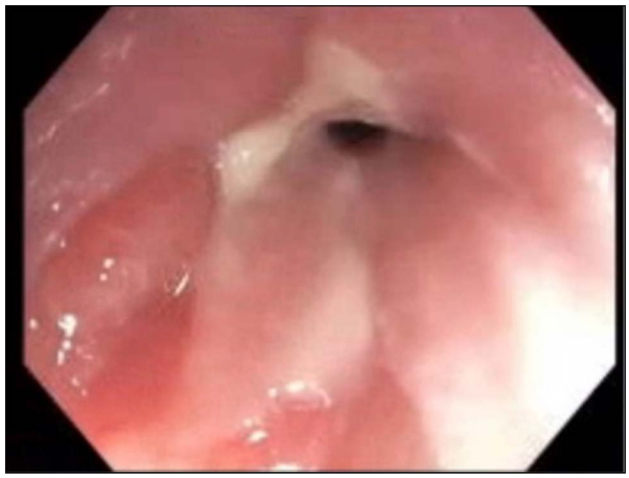

Figure 3. Esophagogastroduodenoscopy LA Grade B (one or more mucosal breaks, greater than 5 mm, not extending between the tops of two mucosal folds) esophagitis with minor bleeding on contact.

revealing grade C esophagitis, chronic gastritis, normal duodenum, and no active bleeding. *Helicobacter pylori* testing was negative. At the time of discharge, the patient's hemoglobin was 10 g/dL, and he had not received any blood transfusions during this admission. He had resolution of emesis, was having small brown stools, and was discharged with a PPI.

The patient returned 1 week later with melena and coffee-ground emesis. Initial evaluation on this admission showed a comfortable-appearing male who was afebrile, normotensive (104/59 mm Hg), and borderline tachycardic (97/min). He had normal bowel sounds, benign abdominal examination, and the patient's gastrostomy tube site appeared clean without surrounding erythema or discharge. On digital rectal examination, the patient had normal rectal tone, small amount of brown stool, and no palpable lesions. Anal wink was not assessed, and the patient was not asked to bear down to assess pelvic floor descent, internal anal sphincter relaxation, and external anal sphincter squeeze. Laboratory studies were remarkable for a normocytic anemia (Hgb 5.2 g/dL and mean corpuscular volume 83.8 fL). He received a total of 4 units of packed red blood cells, was started on intravenous PPI therapy, and received intravenous fluids. He underwent repeat esophagogastroduodenoscopy revealing erosive esophagitis with minor bleeding on contact; the stomach and duodenum appeared normal (Figure 3). No aspirates or duodenal biopsies were obtained. The patient also underwent colonoscopy, which demonstrated marked dilation of the entire examined colon and ileum, liquid stool throughout the colon, scattered diverticula in the sigmoid colon, and no evidence of obstruction (Figures 4 and 5). It was later identified that the patient was not receiving PPI therapy as prescribed, resulting in further bleeding and anemia. At the time of discharge, he had improvement of hemoglobin to 9.8 g/dL, with resolution of emesis and bleeding, and was discharged home with gastroenterology follow-up.

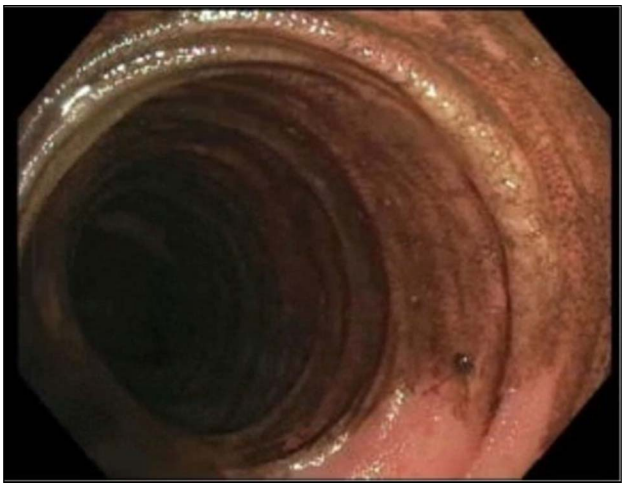

Figure 4. Colonoscopy revealing moderately dilated terminal ileum.

DISCUSSION

This case highlights an individual with HD with multiple gastrointestinal manifestations such as dysphagia, erosive esophagitis resulting in hemorrhage, and a long-standing history of small bowel and colonic ileus resulting in severe constipation. HD often presents with cognitive, motor, and behavioral deficits, as well as gastrointestinal tract abnormalities, such as dysphagia, gut dysbiosis, gastritis, esophagitis, and lower bowel symptoms.[5–10] However, the pathophysiology of these manifestations is not well understood, and therefore, management options are limited.

It is hypothesized that inclusions of mutant huntingtin protein within enteric nervous system (ENS) may be responsible for bowel dysfunction in HD patients.[7,9] Multiple mice models of HD have demonstrated huntingtin inclusions within the neurons and ganglion cells of the ENS.[7,11,12] One study identified significant loss of neuropeptide expressed in the gastric portion of the ENS, reduced mucosal thickness and villi length in the duodenum and colon, prolonged gut transit time, and impaired absorption in a transgenic mouse model of HD (R6/2), compared with wild-type mice.[7] Another study compared the colonic histopathology of a patient with HD and progressive gut motility failure requiring partial colonic resection, with colonic specimens obtained from R6/2 mice.[9] Reduced amounts of enteric neuropeptides and villous abnormalities were observed in the colonic specimens of the patient and HD-like mouse model.[9] Impairment in colonic motility can result in bowel dilation, as frequently observed in colonic pseudo-obstruction.[13] In this case, recurrent acute pseudo-obstruction is possible, given multiple previous CT scans demonstrating colonic dilation, along with episodes of constipation. We hypothesize that this patient's diffuse bowel dilation occurred as a peripheral manifestation of HD through a mechanism of ENS dysfunction.

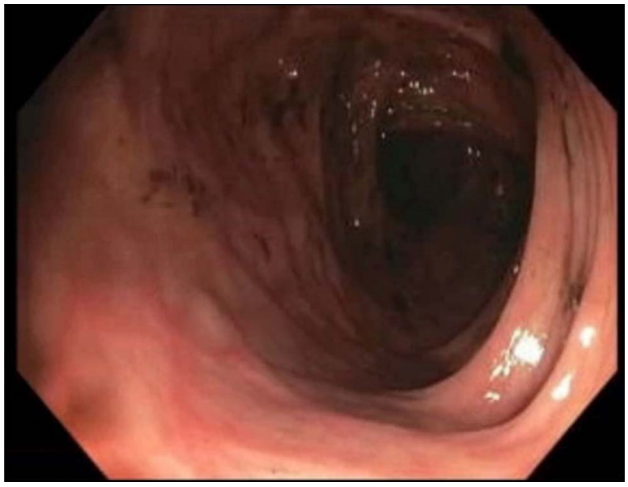

Figure 5. Colonoscopy revealing grossly dilated lumen of the colon and moderate amount of liquid stool found in the entire colon.

The literature is sparse regarding the presence of esophagitis and gastritis in HD. One study identified a high prevalence of gastric and/or esophageal inflammation in patients with HD who did not report any symptoms.[6] The etiology for the absence of symptoms is unclear but may be due to abnormal sensory processing within the ENS and lack of pain recognition or sensation of the disease process until progression to severe inflammation.[6,14] Furthermore, there may be a histologic etiology; evaluation of the gastric mucosa of HD-like mice identified abnormalities in the densities of chief cells and G cells, suggesting a predisposition of HD patients toward upper gastrointestinal inflammation.[15] Gastrointestinal manifestations of HD are heterogenous and can reduce the quality of life of individuals with HD. In this report, we report a unique case of an individual with progressive HD with preexisting dysphagia who presented with gastrointestinal inflammation and found to have significant small and large bowel dilation. Further studies are required to elucidate the exact pathophysiology and appropriate therapeutic modalities.

DISCLOSURES

Author contributions: S. Kolachana: literature review, drafting of the manuscript, and approved the final draft submitted. K. Motwani: literature review, drafting of the manuscript, and approved the final draft submitted. S. Sakiani: revising the manuscript and approved the final draft submitted. K. Motwani is the article guarantor.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received July 3, 2023; Accepted December 7, 2023

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