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CASE REPORT | STOMACH

Co-occurrence of Gastric Xanthoma and Numerous Large Hyperplastic Polyps as a Complication of Argon Plasma Coagulation in GAVE

Elona Poltiyelova, DO[1], Natalie Balassiano, MD[2], and Saphwat L. Eskaros, MD[3]

[1]*Department of Medicine at Westchester Medical Center, Valhalla, NY*
[2]*Department of Medicine at Queens Hospital Center, Jamaica, NY*
[3]*Department of Gastroenterology at Queens Hospital Center, Jamaica, NY*

ABSTRACT

Gastric antral vascular ectasia is a form of gastrointestinal bleeding commonly treated with argon plasma coagulation (APC). APC is a noncontact electrocoagulation technique that transmits energy through ionized argon gas, ultimately coagulating and cauterizing the bleeding vessels. We report a rare case describing an association between APC therapy for gastric antral vascular ectasia and the subsequent development of hyperplastic polyps and gastric xanthoma. This outcome underscores the need for further research into refined treatment strategies to prevent such complications and highlights the importance of recognizing this complication and understanding its risk factors.

KEYWORDS: gastric antral vascular ectasia; GAVE; argona plasma coagulation; APC; hyperplastic polyps; GAVE and gastric xanthoma; gastric xanthoma

INTRODUCTION

Gastric antral vascular ectasia (GAVE), also known as watermelon stomach, is a cause of upper gastrointestinal bleeding characterized by the dilation of blood vessels in the lining of the stomach. The histopathology demonstrates vascular ectasia, fibrin thrombi, and fibromuscular hyperplasia of the lamina propria.[1] Treatment options for GAVE include various endoscopic procedures, with argon plasma coagulation (APC) being the most commonly used technique. Other endoscopic treatments include endoscopic band ligation (EBL), radiofrequency ablation, and laser therapy.

Hyperplastic polyps (HP) account for more than 50% of gastric polyps, and although generally considered benign, there is evidence supporting malignant potential of gastric HP, especially with polyps $>$ 5 mm in size.[1] Gastric xanthomas are rare benign lesions with yellow-white plaque appearance on endoscopy that can be a predictive marker for early gastric cancer.[2] In this study, we present a rare case describing an association between APC therapy for GAVE and the subsequent development of HP and gastric xanthoma.

CASE REPORT

A 76-year-old man with a history of alcohol-associated cirrhosis was sent to the emergency department after outpatient laboratory values revealed a drop in hemoglobin (HGB) from 10.2 to 7 g/dL. In the emergency department, the patient's vital signs were within normal limits, and HGB was 6.8 g/dL. An esophagogastroduodenoscopy (EGD) was performed and revealed small esophageal varices and moderate GAVE in the gastric antrum (Figure 1). GAVE was successfully treated with APC (Figure 1). There were no polyps appreciated. The patient refused colonoscopy at this time and was recommended to repeat EGD in 8 weeks and start pantoprazole 40 mg daily. However, he was lost to follow-up and presented 8 months later with dizziness and shortness of breath. HGB was 6.9/dL, and an EGD was performed, which revealed multiple 5–20 mm sessile inflammatory polyps with white exudates,

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Correspondence: Elona Poltiyelova, DO (elonapolt@gmail.com).

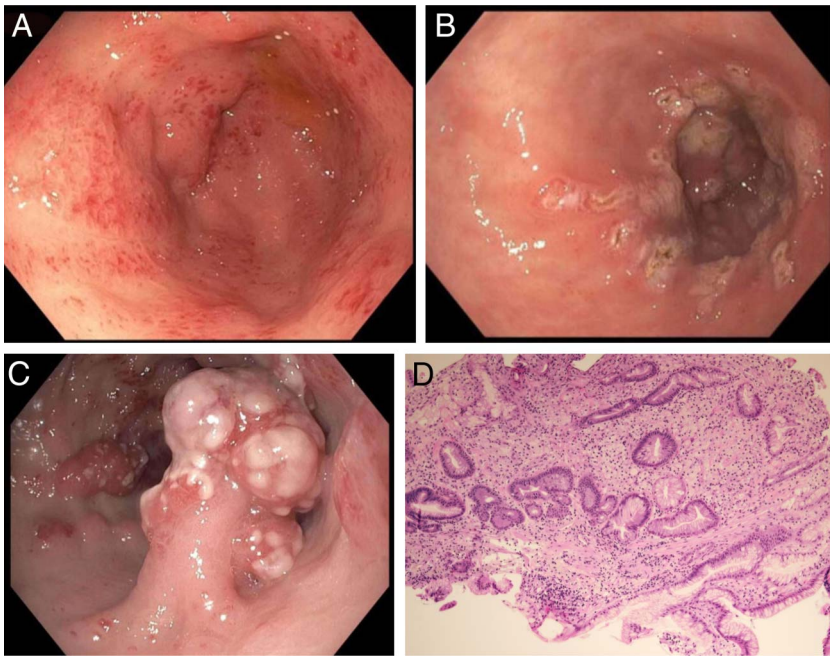

Figure 1. (A) Gastric antral vascular ectasia in the gastric antrum. (B) Gastric antral vascular ectasia treated with argon plasma coagulation therapy. (C) Prepyloric (antral) polyps discovered 8 months after argon plasma coagulation therapy. (D) Gastric xanthoma pathology image: gastric mucosa lined by columnar epithelium with lamina propria showing sheets of foamy macrophages.

likely the result of previous APC (Figure 1). Gastric polypectomy was performed due to concern for premalignant risk. The biopsy results showed HP and gastric xanthoma.

DISCUSSION

GAVE, or watermelon stomach, is often associated with various medical conditions including cirrhosis, congestive heart failure, and renal disease. Endoscopically, GAVE typically presents as longitudinal rows of flat, red stripes which represent dilated mucosal vessels, radiating from the pylorus into the antrum, resembling the pattern of a watermelon.[1] The endoscopic appearance of the GAVE presented above was the classic linear striped GAVE, which shows flat/petechial longitudinal stripes along the antrum. At times, these lesions can also spread out in a diffuse pattern, labeled as punctuate GAVE. Another form of GAVE is a nodular form which is characterized by benign-appearing smooth nodules predominantly in the antrum and accounts for about 30% of all GAVE.[3]

The primary treatment for GAVE is endoscopic coagulation therapy, which can be broadly divided into contact thermal coagulation such as heater probe, bipolar cautery, radiofrequency ablation, and noncontact thermal coagulation such as Nd-YAG laser therapy and APC.[1,2] In severe refractory cases that do not respond to endoscopic treatments, surgical antrectomy can be performed.[4] Furthermore, the literature has shown that liver transplantation can resolve GAVE and related anemia in patients with cirrhosis.[5]

EBL, the standard treatment of esophageal varices, is another form of endoscopic therapy for GAVE. It involves applying ligation bands to mucosal areas with abnormal appearance, ultimately resulting in a fibrotic wound healing response of the mucosa and submucosa. Notably, nodular GAVE often responds well to EBL therapy.[6] A meta-analysis on EBL for the treatment of GAVE, published in 2021, demonstrated that 81% of patients responded to EBL treatment, while the recurrence rate was 15.4%, and the rate of adverse effects was 15.9%.[7] A review was also done comparing APC to EBL treatment of GAVE and found that EBL had less recurrence of bleeding, higher endoscopic eradication rates, and decreased transfusion requirements.[8]

Although the optimal treatment of GAVE has not been confirmed due to a lack of high-quality randomized controlled trials, among the multiple therapeutic options available, APC is more commonly used. Advantages of APC include superficial coagulation with reduced risk of complications, its ease of application, rapid treatment of multiple lesions, and lower cost compared with laser therapy.[9] Although APC is a more superficial method of coagulation compared with other forms of coagulation, several circumstances, such as repeat coagulation at a specific site, use of high-energy settings, and contact between with catheter tip and mucosa, can lead to increased thermal injury and, in turn, a more proliferative response, and in some cases, the development of HP.[10] However, further study into the relationship between thermal settings of APC and tissue proliferation and repair response is needed.

The exact etiology of HP is unknown; however, there are associations with various forms of inflammation and hypergastrinemia, such as autoimmune gastritis, atrophic gastritis,

Helicobacter pylori gastritis, proton-pump inhibitor therapy, and Zollinger-Ellison syndrome.[11,12] The polyps are thought to result from excessive regeneration after mucosal damage. In addition, gastrin stimulates gastric mucosal cell growth and could further increase the response of gastric mucosa to injury.[13] In our patient, the exaggerated repair of the mucosa is likely from the thermal injury of APC and hypergastrinemia. In addition, our patient was started on pantoprazole 40 mg daily after his first EGD showed GAVE. There has been literature proposing that proton pump inhibitor (PPI) use can contribute to hemorrhage from GAVE by increasing gastrin levels. In multiple case reports, there was a resolution of bleeding from GAVE after PPI cessation. This proposes a theory that PPI use can contribute to hemorrhage from GAVE by increasing gastrin levels.[14] This could have also contributed to his polyp development since hypergastrinemia stimulates gastric mucosal cell growth and increases the mucosal response to injury.

Furthermore, the biopsy also revealed gastric xanthoma. The gross appearance of the polyps shown in Figure C resembles xanthomas. Histology showed clusters of lipid-laden foamy macrophages within the lamina propria along with foamy cytoplasm and centrally located nuclei without atypia. The Periodic acid-Schiff staining was negative. Gastric xanthomas are rare, benign lesions with yellow-white plaque appearance on endoscopy that can be a predictive marker for early gastric cancer.[15] The etiology of gastric xanthomas remains unclear, but they also appear to be associated with inflammation of the gastric mucosa and possibly a healing response to local trauma, similar to hyperplastic factors. There are prior cases of reported gastric xanthoma development at the gastroesophageal junction after a radiofrequency ablation therapy for Barrett's esophagus.[2] However, neither cases of gastric xanthoma occurrence after APC therapy for GAVE nor cases of co-occurrence of gastric xanthoma along with HP after APC therapy for GAVE were reported in the literature previously.

The presence of these polyps and gastric xanthomas, especially in the context of APC therapy, highlights the need for further research into the association between gastric xanthomas, HP, GAVE, and APC therapy. Given the size and quantity of the polyps, our patient underwent polypectomy for possible premalignant risk. However, further studies need to be done to evaluate whether the presence of gastric xanthoma in the hyperplastic polyp signifies elevated malignancy potential in post-APC therapy.

To conclude, we must be aware that APC treatment of GAVE can lead to the development of hyperplastic gastric polyps and gastric xanthomas. This case highlights the importance of recognizing this complication and understanding its risk factors.

DISCLOSURES

Author contributions: E. Poltiyelova is the article guarantor and is responsible for overall composition. N. Balassiano performed literature review and assisted with composition and editing. Feedback and editorial changes were made by S. Eskaros.

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Informed consent was obtained for this case report.

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