CASE REPORT

Chronic Anemia Revealing an Idiopathic Watermelon Stomach: Case Report

Hanane Delsa [a,b,*], Imane Rahmouni [a,b], Yassamin B. Sadafyine [a,b], Fatima Belabbes [a,b], Anass Nadi [a,b], Fedoua Rouibaa [a,b]

[a] Cheikh Khalifa International University Hospital, Mohammed VI University of Sciences and Health, Casablanca, Morocco
[b] Research Entity, Mohammed VI Center for Research & Innovation, Rabat, Morocco

Abstract

Watermelon stomach, also known as gastric antral vascular ectasia (GAVE) syndrome, is a rare entity. Patients often present with profound unexplained anemia with or without bleeding externalization. We made the diagnosis during a digestive endoscopy for an etiological assessment of this anemia.

Endoscopically, antral erythematous lesions in stripes with a punctate appearance, sometimes hemorrhagic, may suggest a watermelon stomach. The pathophysiology of the watermelon stomach remains complex and unclear. Although several pathologies remain implicated, sometimes, it can be idiopathic. The effectiveness of numerous treatments has been evaluated with relatively satisfactory results.

This is a rare case of an idiopathic watermelon stomach in a female patient with iron deficiency anemia. Endoscopic treatment was performed with argon plasma coagulation (APC). This treatment option remains the best satisfactory therapy for this patient without complications, recurrence, or transfusion requirements and with a positive outcome.

APC is currently the best technique for the treatment of GAVE, allowing the prevention of medical treatment and the use of iterative transfusions with good results.

Keywords: Anemia, Endoscopy, Watermelon stomach, Argon plasma coagulation, Case report

1. Introduction

Identifying the cause of paucisymptomatic chronic anemia is challenging; however, it can sometimes be a rare etiology.

Gastric antral vascular ectasia (GAVE) or watermelon stomach is an uncommon cause of occult chronic gastrointestinal bleeding [1].

The diagnosis is typical in endoscopy. Erythematous lines are often found parallel to each other, converging on the pylorus, bleeding in places in contact with an aspect of the watermelon stomach [1].

The physiopathology remains unknown until now, with several hypotheses. It is mostly associated with cirrhosis, chronic renal failure, and autoimmune diseases, such as scleroderma; however, it can be idiopathic [2].

2. Case presentation

A 56-year-old female patient was referred to our department for an endoscopic assessment of poorly tolerated deep microcytic iron deficiency anemia.

The patient was followed up for chronic iron deficiency anemia, which was never explored for 17 years. The patient's anemia was refractory to a 5-year course of oral iron supplementation. She was not diagnosed with any other known diseases, such as autoimmune diseases, chronic liver diseases, and chronic renal failure.

Clinically, the patient presented with deep chronic asthenia, pallor, and dyspnea on exertion, without mention of hemorrhagic symptoms, such as melena, hematochezia, and hematemesis.

On physical examination, the patient was stable, conscious, alert, and oriented to person, place, and

Received 19 January 2023; revised 4 August 2023; accepted 4 August 2023.
Available online 25 January 2024

* Corresponding author at: Department of Gastroenterology and Hepatology, Cheikh Khalifa International University Hospital, Mohammed VI University of Sciences and Health, Casablanca, Morocco.
E-mail addresses: dr.delsa.hanane@gmail.com, hdelsa@um6ss.ma (H. Delsa).

https://doi.org/10.56264/2658-865X.1095

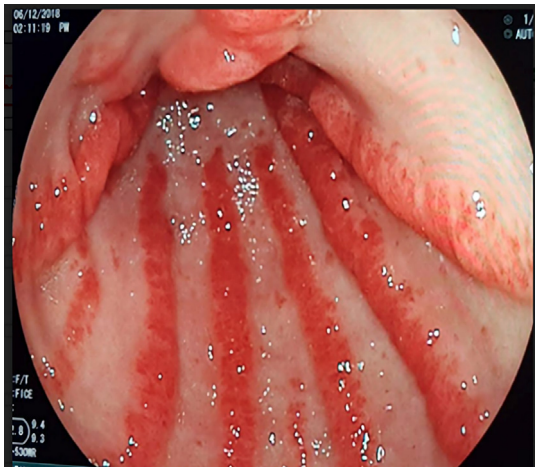

Fig. 1. Endoscopic aspect of the watermelon stomach.

time. However, the patient's resting vital signs showed mild tachycardia at 90 beats/min without other significant findings. The rest of the physical examination, including rectal examination, was normal.

Biological assessment showed a hypochromic, microcytic, iron deficiency anemia at 6 g/dL, with a low serum iron level of 4 μmol/L.

We admitted the patient and transfused three bags of packed red blood cells.

Upper gastrointestinal endoscopy revealed red punctiform spots, compatible with vascular ectasia, strictly limited to the antrum, showing a characteristic feature of the watermelon stomach (Fig. 1). Routine biopsies of the stomach, antrum and fundus were performed and showed non-specific inflammation.

We performed complementary laboratory tests to evaluate hepatic, renal, and thyroid functions, complete blood count, coagulation tests, hepatitis B and C serology, antimitochondrial and smooth muscle antibodies, and complete autoimmune tests. All test results were negative.

Abdominal ultrasonography did not reveal any sign of portal hypertension or cirrhosis. FibroScan was normal as well.

We proceeded with an argon plasma coagulation (APC) session: our procedure was performed under sedation using a fibroscope, the generator was programmed at 50 W with a flow rate of 0.6 L/min, so we initially introduced our axial probe and coagulated as we went along without contact with the mucous membranes. The lesions were assessed in a progressive and non-circumferential way to avoid post-APC pyloric stenosis; compared with lesions at the level of the lateral walls, we proceeded with coagulation using a lateral probe. Fig. 2 shows the final results at the end of our first APC session.

The patient required five APC sessions until the vascular lesions were extinguished, with good clinical and endoscopic improvement.

Evolution was good; the hemoglobin level was stable at 12 g/dL, without the requirement of transfusions. Proton pump inhibitors were prescribed after every APC session for 1 month.

3. Discussion

Watermelon stomach is an occasional cause of gastrointestinal bleeding, accounting for approximately 4% of all upper gastrointestinal bleeding cases [1].

Rider et al. have reported the first case of gastric vascular ectasia in 1953, noting "an erosive type of atrophic gastritis with marked venocapillary ectasia," in a gastrectomy specimen of an elderly woman with an occult gastrointestinal bleed [3], and in 1984, Jabbari et al. have called it "watermelon stomach" as it became known [2].

3.1. Presentation and diagnosis

Patients with GAVE are often females who present with permanent asthenia and skin pallor

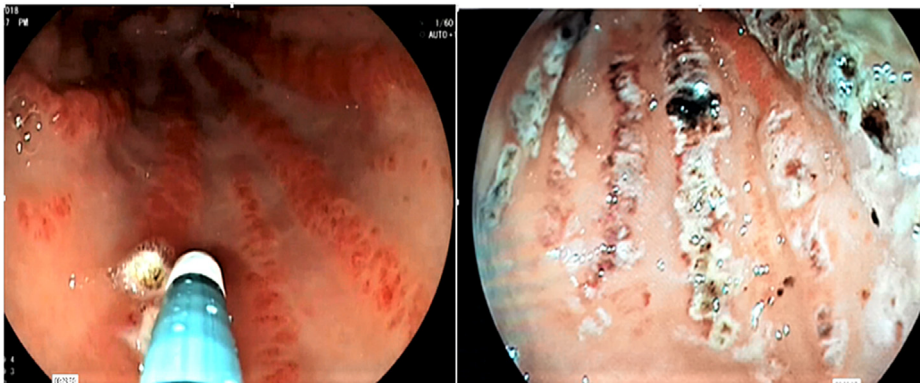

Fig. 2. Watermelon stomach treated with argon plasma coagulation.

because of chronic iron deficiency anemia [4]. GAVE has been diagnosed in patients with lesions that may have been overlooked in the past.

The characteristic features of GAVE seem to include the endoscopic appearance of longitudinal hypertrophic folds, the histological features of hyperplastic surface mucosa, dilated and thrombosed capillaries, fibromuscular hyperplasia of the lamina propria, and ectatic submucosal venous channels [4].

Otherwise, GAVE can present as a homogeneous pattern leading to diffuse antral redness [5].

3.2. Pathogenesis and etiology

The pathophysiology of watermelon stomach remains unclear, with several hypotheses. Portal hypertension is probably a predisposing factor; however, GAVE is perhaps more related to portosystemic shunts than portal hypertension [6].

The peristaltic alterations caused by antro-pyloric motility dysfunction, which leads to partial prolapse of the gastric mucosa distal to the pylorus, with mechanical stress and formation of ectatic vessels, may explain the endoscopic aspect of the disease [3].

Hormonal (i.e., gastrin and pepsinogen, among others) and neurohormonal factors are related to the dysfunction; otherwise, a hypothesis suggests that angiodysplasia is a primary pathological process or a result of fibromuscular hyperplasia or high local concentrations of vasodilators [7].

Watermelon stomach is commonly associated with or caused by several pathologies. The most frequent causes are autoimmune diseases, renal failure, and cirrhosis (Table 1) [6,7].

Table 1. Diseases associated with gastric antral vascular ectasia in the absence of cirrhosis [7].

Diabetes mellitus
Chronic renal failure
Coronary artery disease and hypertension
Sjogren's syndrome
Rheumatoid arthritis
Systemic sclerosis
Calcinosis, Raynaud's disease, esophageal dysmotility, sclerodactyly, and telangiectasia (CREST)
Systemic lupus erythematosus
Polymyalgia rheumatic
Bone marrow transplantation
Acute myelogenous leukemia
Monoclonal gammopathy of undetermined significance
Hypothyroidism
Nodular regenerative hyperplasia
Gastric carcinoma, aortic stenosis
Lymphoma, Parkinson's disease

3.3. Management

The treatment of GAVE is sometimes complex, characterized by endoscopic treatments that can be effective, in addition to iron supplementation. We will detail below the different therapeutic options for this disease.

Concerning the medical treatment of watermelon stomach, many patients are satisfied with iron supplementation with good clinical-biological evolution; however, others present with deglobalization, thus requiring iterative transfusions of up to 10 units of globular pellets per year [5], with a high risk of viral infection that transfusions can induce and other complications, such as endotoxin shocks [8]. The goal of pharmacological, endoscopic, and surgical treatments is to reduce or eliminate blood transfusions, subsequently minimizing the risks.

A study has shown that hormonal treatment (i.e., estrogen and progestogen) are inadequately effective in telangiectasias; however, this study showed many biases. Otherwise, octreotide is a safe drug that may be useful in controlling the recurrent gastrointestinal bleeding due to gained angiodysplasia and watermelon stomach, especially in patients who are not candidates for surgery [9,10]. However, treatment with proton pump inhibitors has not shown effectiveness, which seems logical because of the preexistence of achlorhydria [11].

3.4. Endoscopic treatment

Several endoscopic techniques have been described in clinical case reports; however, these case reports had insufficient follow-ups for judging long-term efficacy of endoscopic techniques (i.e., heat probe, cryotherapy, neodymium yttrium aluminum garnet laser, and endoscopic band ligation (EBL). APC is the most frequently used technique in our context [11,12].

APC uses electrical energy through ionized argon gas (plasma), which results in coagulation necrosis of the tissues. One of the advantages of this endoscopic technique is the limited deep penetration, which reduces the risk of perforation, making this therapy a promising tool for the endoscopic treatment of hemorrhagic mucosal lesions of the gastrointestinal tract [12].

This was the case in the patient in this case report, who showed a suitable response and tolerance to APC, without complications. The patient showed satisfactory clinical and biological improvement, without the requirement of transfusions after five APC sessions.

However, immediate failure rates of up to 14% have been reported [13]. Some authors have found that APC is sometimes insufficient to obtain therapeutic success without recurrence in the medium and long terms. Moreover, APC has been shown to be associated with a high recurrence rate (40%−100%), with less than 50% of patients achieving recurrence-free survival 1 year after APC [14]. Furthermore, some studies have shown that APC is associated with complications, such as sepsis, pyloric stenosis, and gastric obstruction syndrome, observed in 20%−33% of patients [12−14].

Furthermore, several studies have shown the success and efficacy of second-line cryotherapy and radiofrequency after APC to treat vascular ectasias [15,16].

When GAVE is related to severe liver damage and portal hypertension, APC has a high recurrence rate of GAVE in the medium term after treatment, so EBL may be useful as a treatment for GAVE. It is superior to APC or other procedures [17].

Furthermore, several cases of intra-arterial embolization of watermelon stomach refractory to endoscopic treatment have been described. Terawaki et al. have reported effective and successful embolization in GAVE. Furthermore, some complications have been reported, including necrosis and ulcerations of the gastric wall [18]. Embolization remains an additional treatment option in patients who are ineligible for endoscopic treatment, those who present with several episodes of recurrent bleeding, or those who do not want surgery.

Finally, surgical excision is reserved as the last resort for recurrent cases and allows radical treatment; however, it comes at the cost of significant morbidity and mortality. Gastric antrectomy, followed by Billroth I or II or Roux-en-Y reconstruction, remains the reference technique [19].

Surgery has been shown to be associated with high success rates with long-term hemostasis and no transfusion requirement in a study with a 2-year follow-up [19,20]. Some classic complications have been described, including dumping syndrome, diarrhea, and vitamin malabsorption [19]. Nonetheless, surgery is still considered the last treatment option for GAVE [20].

In summary, GAVE is a rare cause of occult chronic gastrointestinal bleeding and is typically diagnosed using upper gastrointestinal endoscopy. Nowadays, APC is the most common technique with good results and low complications [21].

4. Conclusion

Watermelon stomach can be a rare cause of iron deficiency anemia. Several therapeutic endoscopic options have been developed. APC is currently the best technique used, and this technique has been employed in our patient, thus allowing the prevention of medical treatment and the use of iterative transfusions.

Conflicts of interest

The authors declare that there is no conflict of interests regarding the publication of this article. All authors disclosed no financial relationships.

Ethical considerations

The anonymity of patient' data was preserved. Informed consent was obtained for the publication of this article. No personal data are mentioned.

References

[1] Dulai GS, Jensen DM, Kovacs TO, Gralnek IM, Jutabha R. Endoscopic treatment outcomes in watermelon stomach patients with and without portal hypertension. Endoscopy 2004 Jan;36(1):68−72.
[2] Jabbari M, Cherry R, Lough JO, Daly DS, Kinnear DG, Goresky CA. Gastric antral vascular ectasia: the watermelon stomach. Gastroenterology 1984 Nov 1;87(5):1165−70.
[3] Ryder JA, Klotz AP, Kirsner JB. Gastritis with veno capillary ectasia as a source of massive gastric haemorrhage. Gastroenterology 1953;24:118−23.
[4] Gardiner GW, Murray D, Prokipchuk EJ. Watermelon stomach, or antral gastritis. J Clin Pathol 1985 Nov;38(11):1317.
[5] Gostout CJ, Viggiano TR, Ahlquist DA, Wang KK, Larson MV, Balm R. The clinical and endoscopic spectrum of the watermelon stomach. J Clin Gastroenterol 1992 Oct 1;15(3):256−63.
[6] Novitsky YW, Kercher KW, Czerniach DR, et al. Watermelon stomach: Pathophysiology, diagnosis, and management. J Gastrointest Surg 2003;7:652−61. https://doi.org/10.1016/S1091-255X(02)00435-3.
[7] Wang J, Stine JG, Cornella SL, Argo CK, Cohn SM. Patients with gastric antral vascular ectasia (GAVE) are at a higher risk of gastrointestinal bleeding in the absence of cirrhosis. J Clin Transl Hepatol 2015 Dec 12;3(4):254.
[8] Chamberland M, Khabbaz RF. Emerging issues in blood safety. Infect Dis Clin 1998 Mar 1;12(1):217−29.
[9] Nardone G, Rocco A, Balzano T, Budillon G. The efficacy of octreotide therapy in chronic bleeding due to vascular abnormalities of the gastrointestinal tract. Aliment Pharmacol Ther 1999 Nov 1;13(11):1429−36.
[10] Burak KW, Lee SS, Beck PL. Portal hypertensive gastropathy and gastric antral vascular ectasia (GAVE) syndrome. Gut 2001 Dec 1;49(6):866−72.
[11] Manning RJ. Estrogen/progesterone treatment of diffuse antral vascular ectasia. Am J Gastroenterol 1995 Jan 1;90(1).
[12] Focke G, Seidl C, Grouls V. Treatment of watermelon stomach (GAVE syndrome) with endoscopic argon plasma

coagulation (APC). A new therapy approach. Leber Magen Darm 1996 Sep 1;26(5):254–7.
[13] Swanson E, Mahgoub A, MacDonald R, Shaukat A. Medical and endoscopic therapies for angiodysplasia and gastric antral vascular ectasia: a systematic review. Clin Gastroenterol Hepatol 2014 Apr 1;12(4):571–82.
[14] Nakamura S, Mitsunaga A, Konishi H, Oi I, Shiratori K, Suzuki S. Long-term follow up of gastric antral vascular ectasia treated by argon plasma coagulation. Dig Endosc 2006 Apr;18(2):128–33.
[15] Patel AA, Trindade AJ, Diehl DL, Khara HS, Lee TP, Lee C, Sethi A. Nitrous oxide cryotherapy ablation for refractory gastric antral vascular ectasia. United Eur Gastroenterol J 2018 Oct;6(8):1155–60.
[16] McGorisk T, Krishnan K, Keefer L, Komanduri S. Radiofrequency ablation for refractory gastric antral vascular ectasia (with video). Gastrointest Endosc 2013 Oct 1;78(4):584–8.
[17] Sato T, Yamazaki K, Akaike J. Endoscopic band ligation versus argon plasma coagulation for gastric antral vascular ectasia associated with liver diseases. Dig Endosc 2012 Jul; 24(4):237–42.
[18] Terawaki H, Kobayashi S, Kato J. A case report of hemodialysis patient who presented recurrent bleeding from gastric antral vascular ectasia (GAVE) associated with liver cirrhosis: the effectiveness of trans-arterial embolization to bilateral gastric arteries. J Jpn Soc Dial Ther 2008;41:803–8.
[19] Lim D, Liu S, Meytes V, Binetti B. Laparoscopic subtotal gastrectomy with Rouxen-Y reconstruction for long-term anticoagulation in gastric antral vascular ectasia syndrome. BMJ Case Rep 2019 May 1;12(5).
[20] Alsaeed BH, AlAbdulqader AA, Al-Qadhi AA, Alaswad HA, Foula MS, Alshomimi SJ. Successful Surgical Management of Gastric Antral Vascular Ectasia in a Patient with End-Stage Renal Disease: A Case Report and Literature Review. Am J Case Rep 2023 Mar 13;24:e938543. https://doi.org/10.12659/AJCR.938543.
[21] Hirsch BS, Ribeiro IB, Funari MP, Sagae VM, Mancini FC, Oliveira GH, Moura EG, Bernardo WM. Endoscopic treatment of gastric antral vascular ectasia. Rev Assoc Méd Bras 2022 Feb 28;68:125–34.8.