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Gastric antral vascular ectasia, also known as watermelon stomach - diagnosis and treatment

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Abstract

Gastric antral vascular ectasia (GAVE), also referred to as watermelon stomach is a rare disease accounting for about 4% of non-variceal upper gastrointestinal bleeding. It can manifest as occult bleeding requiring transfusion or acute gastrointestinal bleeding. This condition often coexists with liver cirrhosis, autoimmune diseases, heart failure, in patients post-bone marrow transplantation, or kidney failure. It is crucial to differentiate GAVE from portal hypertensive gastropathy (PHG), because despite a similar clinical presentation, the treatment for these conditions is different.

Endoscopic diagnosis is necessary and in some cases, it may require further investigation and histopathological examination of the biopsy. Treatment is administered to patients with bleeding symptoms. Currently, the most commonly used treatment method is endoscopic thermal ablation using argon plasma coagulation.

The focus of this work is to present essential information regarding the clinical picture, diagnosis and treatment of watermelon stomach.

Keywords : Gastroenterology, gastrointestinal bleeding, endoscopy, ablation, pharmacological treatment, surgical procedure, differential diagnosis

Introduction

Gastric antral vascular ectasia (GAVE), also known as watermelon stomach, involves changes in the mucosal and submucosal layers, typically located in the antral part of the stomach. These changes consist of dilated venous and capillary vessels, visually resembling blotchy

erythematous or bloody streaks. These alterations can be a source of upper gastrointestinal tract bleeding (UGIB), often presenting as chronic bleeding with iron deficiency anemia as a common symptom [1]. The majority of GAVE patients are older people and the incidence of the disease is twice as high in women compared to men [2].

It is rarely an isolated condition and is frequently associated with liver cirrhosis, autoimmune diseases (such as systemic sclerosis, Raynaud's syndrome, visceral lupus), heart failure, in patients post-bone marrow transplantation or kidney failure [3]. GAVE is most commonly diagnosed in conjunction with liver cirrhosis, accounting for up to 4% of all non-variceal upper gastrointestinal bleeding [4].

The endoscopic appearance of the disease often overlaps with portal hypertensive gastropathy, making it challenging to estimate the frequency of the disease in the general population. The disease is most frequently diagnosed in advanced liver cirrhosis [5]. Diagnosing and treating bleeding caused by the ectasia of the prepyloric part of the stomach can be challenging. Currently, there are several methods facilitating the diagnosis and treatment of this condition, including both endoscopic and pharmacological treatment.

Pathomechanism

The pathomechanism of watermelon stomach is not fully known. The main cause is believed to be an increased release of vasoactive factors by neuroendocrine cells in the stomach. Prolonged exposure to these factors leads to dilation of venous and capillary vessels in the mucosal and submucosal layers of the stomach [6]. The second cause is suggested to be increased gastrointestinal tract activity, leading to microtrauma that results in the migration of mucosal fragments through the pylorus into the duodenal bulb. This process causes hypertrophy of the smooth muscle and blood vessels supplying these structures [7].

Gastric antral vascular ectasia is not associated with portal hypertension, as is the case with portal hypertensive gastropathy. Interestingly, liver transplantation does not completely reverse the vascular changes that occurred as a result of this disease [8].

Clinical picture and diagnosis

The clinical presentation of gastric antral vascular ectasia (GAVE) is non-specific, commonly manifesting as upper gastrointestinal tract bleeding (UGIB). Typically, this bleeding is chronic and occult. Less common is presentation with acute bleeding leading to anemia. Asymptomatic cases are rare.

The GAVE presentation resembles portal hypertensive gastropathy (PHG). However, GAVE symptoms often occur in the antral part of the stomach, while PHG affects the body and fundus of the stomach. Therefore, an upper gastrointestinal endoscopy is essential, usually sufficient for diagnosis. In some cases, a more in-depth diagnostic approach and histopathological examination of tissue samples obtained during endoscopy may be necessary to eliminate uncertainties and establish an appropriate treatment plan [9].

The most common endoscopic appearance of GAVE is the presence of red, flat ectatic lines running along the folds of the pylorus. These changes are typically limited to the pylorus, occasionally extending to the gastric cardia, resembling the stripes of a watermelon, hence the name "watermelon stomach" [10].

In comparison, endoscopy of PHG reveals "mosaic" changes, consisting of small, white mesh-like lines separating pink-red areas of the gastric mucosa. Additionally, one may observe red pinpoint lesions, cherry-red spots and brown petechiae [11].

The histopathological image of GAVE is entirely different from PHG. GAVE histology shows distinct, dilated and mildly congested capillaries, with the mucosal lining closely resembling that of the gastric mucosa. Moreover, GAVE is characterized by the proliferation of spindle cells and fibrous hyalinization. In contrast, PHG is associated with follicular hyperplasia and edema resembling reactive gastropathy [9].

It is crucial to differentiate GAVE from portal hypertensive gastropathy, because GAVE does not respond to treatment aimed at reducing portal pressure.

Treatment

The treatment of gastric antral vascular ectasia primarily involves symptomatic treatment, aiming to complete lost blood due to bleeding. Correction of blood loss includes blood transfusion, fluid resuscitation and iron supplementation.

Currently, surgical treatments for Gastric Antral Vascular Ectasia (GAVE), such as gastric antrectomy, including reconstructions using the Billroth I, II and Roux-en-Y methods, are increasingly less common. Endoscopic ablation is recommended instead, as surgical intervention is associated with higher mortality and should be considered as a last resort for individuals who do not respond to treatment [12].

Treatment is mainly administered for GAVE cases presenting with blood loss [13]. Asymptomatic and non-bleeding changes do not require treatment.

Endoscopic treatment

The most commonly performed endoscopic method is thermal ablation using argon plasma coagulation (APC). This procedure utilizes a non-contact device for electrocoagulation of superficial blood vessels using argon plasma. Endoscopic success, defined as complete hemostasis or elimination of the majority of visible lesions in endoscopic examination, can be achieved in 40–100% of treated cases [14].

Recurrent bleeding following thermal ablation procedures often results from the limited depth of mucosal coagulation. Changes in the course of Gastric Antral Vascular Ectasia (GAVE) may also involve the submucosal layer, which may not be adequately treated with APC [15]. Therefore, annual follow-up examinations are recommended to assess the need for repeat coagulation procedures.

Despite the confirmed safety of the given method, the procedure is associated with adverse effects. Among the most commonly reported are gastric obstruction and hypertrophic polyps resulting from the use of APC [14].

Pharmacological treatment

In cases where endoscopic treatment is ineffective, therapies involving progestin-estrogen preparations, somatostatin analogs (octreotide), thalidomide, tranexamic acid, cyproheptadine or cyclophosphamide may be considered.

According to some sources, the first-generation antihistamine drug - cyproheptadine, is suggested to have a role in reversing iron deficiency anemia [16].

In individuals with gastric antral vascular ectasia (GAVE) coexisting with systemic sclerosis or other autoimmune diseases, the use of corticosteroids or immunosuppressive treatment with cyclophosphamide is considered beneficial [17].

Combining estrogen therapy with progesterone is a medication regimen that may reduce the risk of bleeding. However, this therapy does not lead to a reduction in the number of ectatic vessels [18]. Tranexamic acid is an antifibrinolytic medication used to inhibit acute bleeding.

Unfortunately, pharmacological therapy in most cases only treats the symptoms. It does not result in changes in the endoscopic appearance of gastric antral vascular ectasia; therefore, it is not the first-choice treatment [2].

Surgical treatment

Surgical interventions are currently performed only in cases of GAVE patients who do not respond to endoscopic and pharmacological treatments or individuals with extensive vascular malformations. Surgical treatment methods include antrectomy (including reconstructions using the Billroth I, II and Roux-en-Y methods), partial gastric resection and total gastrectomy with esophageal resection.

It is also possible to use laparoscopic gastric resection as a treatment method. This approach is characterized by lower invasiveness and a shorter hospitalization period.

The 30-day mortality rate after surgery is approximately 6.6%, with multi-organ failure being the main cause of death. It is crucial to provide nutritional guidance to patients after surgical procedures, as nutritional deficiencies, including vitamin D, B12, and iron, are significant adverse effects [2].

Summary

Gastric Antral Vascular Ectasia (GAVE), also known as watermelon stomach, is a rare condition characterized by the dilation of blood vessels in the antral part of the stomach. This condition can lead to upper gastrointestinal bleeding, often presenting as chronic bleeding and anemia.

The diagnosis of GAVE relies mainly on endoscopy, where characteristic changes in the gastric mucosa, resembling watermelon stripes, are observed. Treatment often begins with endoscopic therapy, especially thermal ablation using argon plasma. Pharmacotherapy, including progestagens, estrogens, tranexamic acid, or immunosuppressive drugs, may be used in cases where endoscopic treatment is ineffective. In challenging situations, surgical options such as gastric antrectomy can be considered.

It is important to note that while pharmacological and endoscopic treatments aim to alleviate symptoms and control bleeding, in many cases, they provide symptomatic relief rather than a cure. Monitoring patients, especially in cases with a risk of recurrent bleeding, is advisable.

Although advancements in endoscopy and pharmacological therapies have introduced new treatment possibilities, there are still situations where surgical therapy is necessary. The decision on the appropriate treatment strategy is typically made by a multidisciplinary team of doctors, taking into account the individual characteristics of the patient and the course of the disease.

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