

Digestive Bleeding Revealing Aortic Valve Stenosis: Heyde's Syndrome

K. Boualiten^{1*}, T. Adioui¹, I. Mouslim¹, B. Aourarh¹, A. Touibi¹, R. Laroussi¹, I. Radouane¹, S. Ouahid¹, S. Berrag¹, F. Nejari¹, M. Tamzaourte¹

¹Gastroenterology I unit, Mohamed V Military Teaching Hospital, Mohamed V- Souissi University, Rabat, Morocco

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*Corresponding author: K. Boualiten

Gastroenterology I unit, Mohamed V Military Teaching Hospital, Mohamed V- Souissi University, Rabat, Morocco

Abstract

Case Report

Heyde's syndrome is an under reported systemic disease of gastrointestinal and cardiac manifestation in older adults. It is characterized by a triad of aortic stenosis, angiodysplasia with bleeding and acquired von Willebrand syndrome. Heyde's syndrome is a treatable condition in most cases, especially in the current era of evolution in interventional cardiology and gastroenterology. Newer endoscopic technologies may prove beneficial. Aortic valve replacement is claimed to minimize or even stop the bleeding in such patients. The aim of our review article is to summarize the basic pathophysiology, diagnostics and management of Heyde's syndrome.

Keywords: Heyde's syndrome - Gastrointestinal bleeding - Aortic valve stenosis - Gastrointestinal angiodysplasia.

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INTRODUCTION

Angiodysplasia is the most common vascular lesion of the gastrointestinal tract, and this condition may be asymptomatic, or may cause gastrointestinal (GI) bleeding [1]. It is a degenerative lesion of previously healthy blood vessels found most commonly in the cecum and proximal ascending colon but bleeding from proximal intestinal angiodysplasias, and nasal bleeding is also reported [2, 3]. The connection between aortic stenosis and gastrointestinal (GI) bleeding resulting from angiodysplasias is known as Heyde syndrome. A crucial role for von Willebrand factor (VWF) is thought to play in the process of angiogenesis suppression. In these settings; the mechanical destruction of von Willebrand multimers as they turbulently pass through the narrowed aortic valve, increases risk of GI bleeding through the formation of angiodysplasias [4-6]. In this case report, we discuss the presentation, diagnosis approach, and management of patients with Heyde syndrome.

CASE REPORT

A 65-year-old man with a medical history of high blood pressure, presented to the emergency department with abdominal pain and black stools during for 1 week. He also noted a shortness of breath exercise and significant fatigue for the same duration. There was no prior history of alcohol consumption, drug use, nor smoking.

On initial examination, he was lethargic, with a blood pressure of 101/55 mmHg, a pulse of 94 beats/minute, a respiratory rate of 16 breaths/minute, and oxygen saturation of 100%. He had conjunctival pallor. Abdominal examination was normal. A systolic ejection murmur was noted during the cardiovascular examination.

Laboratory investigations revealed a low hemoglobin level of 7 g/dL (13-17 g/dL), hematocrit 26% (41% to 53%), white blood cell count $5.9 \times 10^9/L$ (4 to $10 \times 10^9/L$), platelet count $228 \times 10^9/L$ (150 to $450 \times 10^9/L$), normal liver and kidney tests, the Serum electrolytes, prothrombin time and international normalized ratio (INR) were within normal limits.

After blood transfusion, An esophagogastroduodenoscopy was normal and a total colonoscopy revealed multiple and large arteriovenous malformations of the right colon (Figure 1) which were repeatedly coagulated with argon plasma, but the process was ineffective.

An echocardiogram revealed altered left ventricular ejection fraction, severe aortic stenosis with a valve area of 0.9 square centimeters and a mean gradient of 70 mmHg (Figure 2 and 3).

Given the atypical presentation of the angiodysplasias and the presence of AS, a platelet function assay (PFA) was ordered. It was abnormal

pointing toward the presence of acquired von Willebrand syndrome (AVWS). Hence, a diagnosis of Heyde’s syndrome was established.

Despite repeated endoscopic treatment, he continued to have active gastrointestinal bleeding, and surgical hemicolectomy was performed. After the disappearance of the bleeding and the stabilization of the hemoglobin following colonic surgery, the patient was

transferred to the cardiology department for valve replacement

During 6-month follow-up after aortic valve replacement, he had stable hemoglobin at 13 g/dl without further episodes of GI bleeding. A control echocardiogram was performed showing a mechanical prosthesis in a properly functioning aortic position (Figure 4).

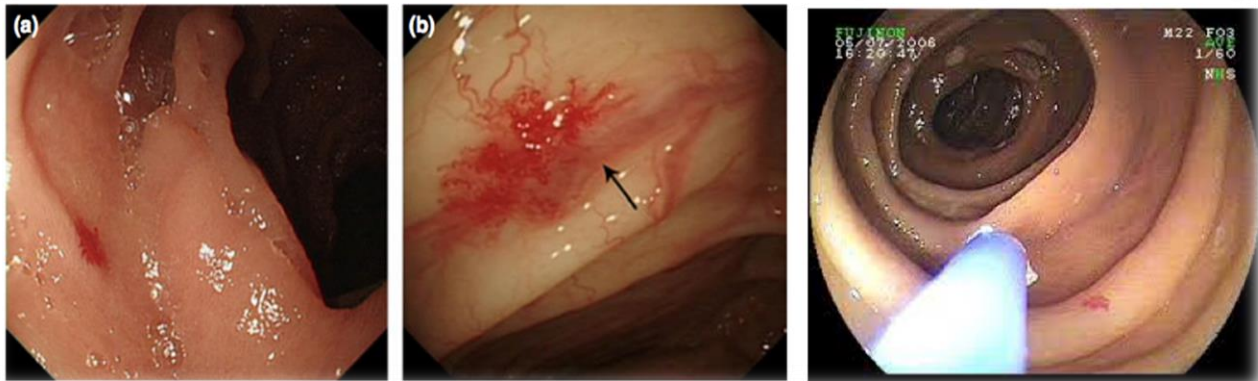


Figure 1: Colon angiodyplasia lesion

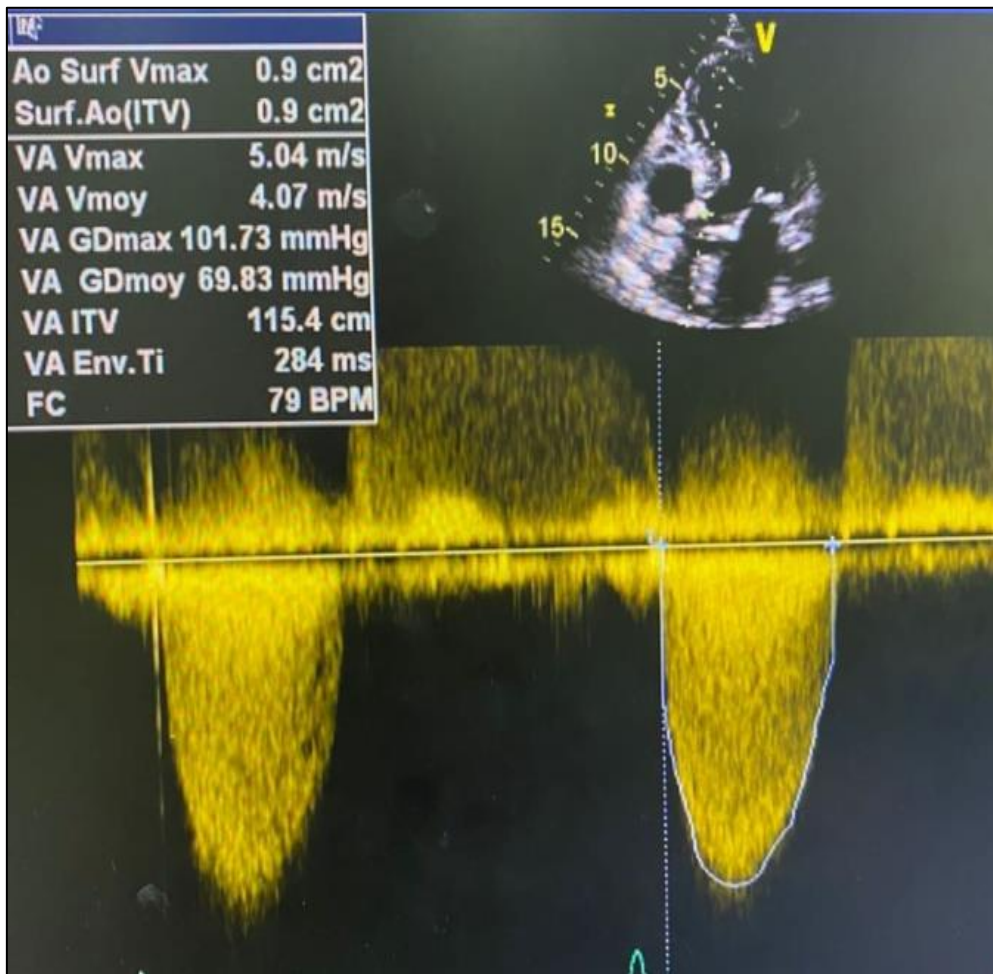


Figure 2: Parasternal section Long axis showing a remodeled aortic valve, very calcified with limited opening



Figure 3: Apical cut 5 cavities Continuous Doppler on the aortic valve showing an average gradient of 70 mmHg with an aortic surface area of 0.9 cm 2 in favor of tight aortic stenosis

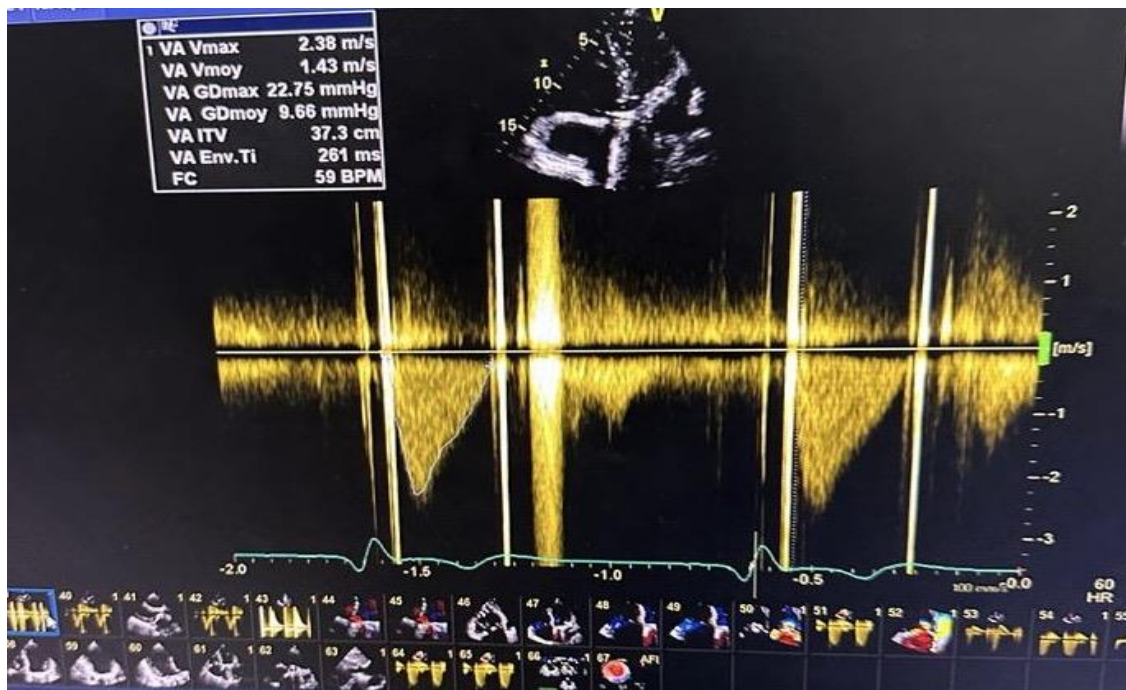


Figure 4: Mechanical prosthesis in properly functioning aortic position

DISCUSSION

Heyde's syndrome is a multi-system disorder of the gastrointestinal, hematological and cardiovascular, (GI) system it is a combination of aortic stenosis, intestinal angiodysplasias and acquired Von Willebrand syndrome. In 1958, Dr. Edward Heyde made the initial description of the connection between GI hemorrhage and aortic stenosis [7]. But it wasn't until the late 1980s and early 1990s that the pathophysiologic mechanism of Heyde's syndrome was thought to involve coagulopathy in the form of acquired von Willebrand disease [8, 9].

In the literature, Heyde syndrome is probably underestimated and occurs mainly in older people (aged over 65 years). Aortic stenosis is approximately 7% in

people 75 years or older and can increase to 10% in people older than 80 [10, 11].

Some authors have suggested that the rate of aortic stenosis in patients with gastrointestinal hemorrhage is 30 to 40% [12]. Others have reported a significantly lower prevalence. The risk of gastrointestinal bleeding is 100 times higher in patients for whom aortic stenosis is the gold standard diagnosis than in patients without aortic stenosis [12]. However, the most common vascular anomaly of the gastrointestinal tract is angiodysplasia, which is also the second leading cause (after diverticulosis) of lower gastrointestinal bleeding in patients over 60 years of age [1].

Heyde syndrome has multiple possible causes, but the most compelling connection between gastrointestinal bleeding from angiodysplasia and aortic stenosis is a lack of von Willebrand factor high-molecular-weight multimers [8, 12]. High shear stress is linked to aortic stenosis or sclerosis. This increases the activity of the metallo-protease that cleaves von Willebrand factor, which causes the factor to be proteolyzed. It also increases the interactions between von Willebrand factor and platelets, which cause the factor to be cleared or degraded [8]. Acute platelet dysfunction, cholesterol embolization, inflammatory responses, and mucosal ischemia are additional potential factors linked to the pathogenesis of Heyde syndrome.3. Bleeding from angiodysplasia may be the result of a combination of a common gastrointestinal tract vascular disease and an uncommon coagulopathy brought on by a common valvular disease.

The most common vascular lesion of the gastrointestinal tract is angiodysplasia, which may be asymptomatic or result in gastrointestinal (GI) bleeding [1]. 70% of angiodysplasias are found in the cecum and ascending colon, 15% in the jejunum and ileum and the remainder throughout the digestive tract. Usually, these lesions are less than 5 mm in size and are not palpable. Approximately 6% of lower gastrointestinal bleeding cases may be related to angiogenesis. It can be unintentionally discovered during a colonoscopy in up to 0.8% of patients over 50. Lesions in the upper gastrointestinal tract are about 1% to 2% common.

When a patient is suspected of having Heyde's syndrome, the history and physical examination should concentrate on looking for signs of acquired vWS, such as GI bleeding, aortic stenosis, and impaired hemostasis. Apart from a comprehensive medical history, previous episodes and causes of gastrointestinal bleeding, it's important to consider the use of concurrent medications that can intensify gastrointestinal bleeding, such as NSAIDs, anticoagulants, aspirin, and other anti-platelet agents. An echocardiogram can reveal information about the severity of aortic stenosis (ventricular-aortic gradient and the valve area) and will direct treatment options.

Other causes of gastrointestinal bleeding, such as duodenal or stomach ulcers, diverticular disease, gastrointestinal cancer, and inflammatory bowel disease, should be looked into initially. When a patient has gastrointestinal bleeding for which the cause is unknown, the presence of angiodysplasia should alert the doctor to the possibility of aortic valve disease and Heyde syndrome should be considered in the differential diagnosis [1, 12, 13].

A complete set of laboratory investigations is necessary to fully diagnose all variants of von Willebrand disease and von Willebrand syndrome. Ranked in descending order, the sensitivity of various tests for type IIA von Willebrand syndrome in patients

with bleeding gastrointestinal angiodysplasia is as follows: gel electrophoresis (quantification of high-molecular-weight multimers) > PFA-100 closure time > von Willebrand factor ristocetin cofactor > bleeding time > von Willebrand factor antigen [14].

Management of Heyde syndrome often requires a multidisciplinary approach, and treatment options include medical therapy, endoscopic interventions, colon surgery and aortic valve replacement [12]. Repeated blood transfusions may offer some, though transient, symptomatic relief

If endoscopy reveals actively bleeding angiodysplasia, it needs to be treated. Argon plasma coagulation (APC), which uses energy from ionized argon, is the most widely used non-contact technique. Although there is little chance of a perforation, bipolar cauterization can also be successful. The other, less frequently used methods are radiofrequency ablation, injection sclerotherapy, and mechanical hemostasis with endoscopic clips. Treatment is also necessary for non-bleeding angiodysplasia that is unexplained by another etiology and occurs in the context of occult bleeding or severe iron deficiency anemia. Patients with incidentally discovered angiodysplasia who are asymptomatic (no gastrointestinal bleeding or iron deficiency anemia) are typically regarded as having a low risk of bleeding, are not treated, and do not meet the criteria for Heyde's syndrome.

Although emergent bowel resection may be necessary in cases of severe bleeding, bleeding may still occur from other sites [12, 13, 15].

Aortic valve replacement is frequently required for recurrent severe gastrointestinal bleeding, especially when medical and endoscopic interventions have failed and the condition is typically treated with severe aortic stenosis [12, 13, 15]. Heyde syndrome coagulation abnormalities have been shown to improve with valve replacement, which may provide a long-term symptom resolution [12, 13, 15].

CONCLUSION

The existence of aortic stenosis suspected from auscultation and digestive bleeding should raise suspicion of Heyde syndrome. The bleeding digestive system stops after valve replacement. Being given the increasing incidence of aortic stenosis in the elderly, it is expected that Heyde syndrome is increasingly reported. In cases where the indication surgical treatment is limited, other therapeutic alternatives should be offered such as the treatment of angiodysplasia by electrocoagulation or photocoagulation by laser or cryotherapy or by pharmacological means, namely somatostatin analogues orthalidomide [12, 16, 17]. The Involvement of a gastroenterologist and a hematologist

in treatment of such patients helps in resolving various issues pertaining to their respective fields.

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