VER
Vascular & Endovascular Review

Gastric Antral Vascular Ectasia As A Rare Complication Of Imatinib Therapy: Case Series

Satyadi[1,2,3,4,5*], Muhammad Noor Diansyah[3,5], Putu Niken Ayu Amrita[4], Melyna Savitri[4], Pradana Zaky Romadhon[3,5], Ami Ashariati[3,5], Siprianus Ugroseno Yudho Bintoro[4]

[1]Internal Medicine Subspecialist Study Program, Departement of Internal Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.
[2]Internal Medicine Subspecialist Study Program, Departement of Internal Medicine, Dr. Soetomo General Academix Hospital, Surabayam Indonesia.
[3]Division of Hematology and Medical Oncology, Departement of Internal Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.
[4]Division of Hematology and Medical Oncology, Departement of Internal Medicine, Faculty of Medicine,Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.
[5]Departement of Internal Medicine, Universitas Airlangga Hospital, Surabaya, Indonesia.

***Corresponding author:**
Satyadi
Satyadi.sppd@gmail.com

ABSTRACT

Background: Gastric antral vascular ectasia (GAVE) is a rare but clinically significant cause of upper gastrointestinal bleeding, characterized endoscopically by longitudinally dilated vessels in the gastric antrum resembling a “watermelon stomach”. While GAVE is often associated with systemic conditions such as cirrhosis and autoimmune disease, drug-induced etiologies must be considered in hematologic patients, particularly those receiving tyrosine kinase inhibitors (TKIs) like imatinib mesylate (IM).

Case Ilustration: We report three hematologic patients who developed gastrointestinal bleeding after several months of IM therapy. Endoscopic evaluation revealed typical GAVE lesions. Clinical and endoscopic improvement was observed following IM discontinuation. Two patients were successfully transitioned to nilotinib without recurrence of bleeding, and follow-up endoscopy confirmed regression of GAVE lesions.

Discussion: The consistent temporal relationship between IM administration and GAVE onset supports a potential causal link. Although the molecular mechanisms remain unclear, local mucosal irritation and vascular changes induced by IM have been proposed. Management of GAVE includes hemodynamic stabilization, supportive therapy, and endoscopic intervention for active bleeding. However, in drug-related cases, discontinuation of the offending agent and switching to an alternative TKI proved effective and low-risk. Supportive measures alone are insufficient to prevent recurrence if the underlying trigger is not addressed.

Conclusion: This case series underscores the importance of considering drug-induced etiologies in hematologic patients presenting with upper GI bleeding. Thorough medication history, multidisciplinary evaluation, and appropriate therapeutic adjustments are essential. Discontinuation of imatinib and transition to alternative TKIs can prevent recurrence and promote regression of GAVE lesions. Further prospective studies are needed to clarify the molecular mechanisms underlying TKI-associated GAVE and to establish evidence-based clinical guidelines.

KEYWORDS: Chronic Myeloid Leukemia, Imatinib, Gastointestinal Bleeding, Watermelon Stomach.

How to Cite: Satyadi, Muhammad Noor Diansyah, Putu Niken Ayu Amrita, Melyna Savitri, Pradana Zaky Romadhon, Ami Ashariati, Siprianus Ugroseno Yudho Bintoro, (2026) Gastric Antral Vascular Ectasia As A Rare Complication Of Imatinib Therapy: Case Series, Vascular and Endovascular Review, Vol.9, No.1, 183-186

INTRODUCTION

Gastric antral vascular ectasia (GAVE) is a relatively rare but potentially serious cause of upper gastrointestinal bleeding. Clinically, GAVE is often associated with systemic conditions such as liver cirrhosis, autoimmune disorders, and chronic kidney disease (Wang *et al.,* 2015). Its characteristic endoscopic appearance resembles a “watermelon stomach,” and diagnosis is typically confirmed via gastroscopy. Although the exact pathogenesis remains unclear, vascular and immunologic factors are believed to play a role (Hsu *et al.,* 2018).

Imatinib mesylate (IM) is widely used as a first-line therapy for patients with chronic myeloid leukemia (CML) and gastrointestinal stromal tumors (GIST). While generally well tolerated, gastrointestinal bleeding has been reported as a known adverse effect, particularly in patients with GIST, with an estimated incidence of 1.4–5%. In contrast, cases of GAVE-induced bleeding in CML patients receiving IM are exceedingly rare, and the causal relationship between IM and GAVE remains poorly understood (Narukawa *et al*., 2016).

This case series presents three patients—two with CML and one with GIST—who developed GAVE while receiving IM at doses

of 400 mg or higher per day. In all cases, gastrointestinal bleeding and gastric lesions improved following discontinuation or substitution of IM with nilotinib. Notably, one patient experienced recurrent bleeding upon reintroduction of IM, suggesting a possible drug-induced etiology. Given the limited literature on this association, this report aims to highlight the potential link between high-dose IM and GAVE, and to raise clinical awareness regarding its diagnosis and management.

CASE ILUSTRATION

CASE 1

A 43-year-old male patient was initially found to have leukocytosis in December 2021. Following further evaluation in March 2022, he was diagnosed with chronic-phase CML and commenced treatment with IM at a dose of 400 mg once daily. After one year of therapy, he achieved a complete molecular response. However, in May 2023, his hemoglobin level dropped significantly to 6.1 g/dL due to substantial gastrointestinal bleeding. Subsequent investigations were conducted to identify the source of bleeding, and upper gastrointestinal endoscopy revealed the presence of GAVE. The patient underwent local cauterization therapy and was prescribed a proton pump inhibitor (PPI).

Despite treatment, he continued to experience intermittent episodes of active gastrointestinal bleeding, necessitating repeated blood transfusions and cauterization procedures. In August 2023, imatinib was discontinued due to its suspected role in triggering GAVE. Following cessation of IM, the patient no longer experienced gastrointestinal bleeding, required no further local interventions, and remained transfusion-free. His hemoglobin level gradually improved to 13.2 g/dL, and his disease status remained stable, with undetectable BCR-ABL transcripts, despite not receiving any alternative therapy.

CASE 2

A 48-year-old female patient diagnosed with blast crisis-phase CML initiated induction therapy with IM at a dose of 600 mg/day in October 2021. She achieved complete remission (CR) and proceeded to consolidation therapy in January 2022, which included high-dose methotrexate, high-dose cytarabine, methylprednisolone, and continued IM at the same dosage. On day 10 of consolidation, the patient presented with melena. Laboratory evaluation revealed severe cytopenia secondary to chemotherapy, mild elevations in hepatic transaminases (AST and ALT), increased lactate dehydrogenase (LDH), and normal serum creatinine levels.

Upper gastrointestinal endoscopy revealed telangiectatic lesions with active bleeding in the corpus and antrum of the stomach, consistent with GAVE. Given the temporal association, IM was suspected as the causative agent and subsequently discontinued. Nilotinib was initiated as an alternative tyrosine kinase inhibitor. Remarkably, gastrointestinal bleeding ceased within three days of IM withdrawal. A follow-up endoscopic evaluation performed four weeks after the initial bleeding episode confirmed complete resolution of GAVE lesions.

CASE 3

A 68-year-old female was diagnosed in 2021 with low-grade MALT lymphoma involving lymph nodes and bone marrow. She received combination chemotherapy with R-CVP and achieved complete remission, followed by routine hematology surveillance. In February 2022, an abdominal CT scan revealed a mass. Ultrasound-guided biopsy confirmed a GIST with positive CD117 and DOG1 expression, but no KIT mutation (wild-type). Peripheral blood smear showed normal findings. The patient began treatment with imatinib mesylate 400 mg/day in April 2022. Endoscopy and colonoscopy performed in June 2022 revealed two small colonic polyps and vascular ectasia in the stomach and duodenum, without spontaneous bleeding. Adverse effects from imatinib were mild, including grade 2 edema and mild fatigue. However, her hemoglobin gradually declined to 5.9 g/dL by December 2022, despite normal coagulation parameters and serum iron levels. She was treated with PPIs and received blood transfusions every 6–8 weeks.

In August 2023, the patient reported melena. Repeat endoscopy revealed GAVE. Imatinib was discontinued due to its suspected role in the development of GAVE, and a follow-up endoscopy was scheduled two months later to assess reversibility. The PPI dose was also increased. After discontinuation of imatinib, follow-up endoscopy showed significant improvement in gastric and duodenal ectasia. Her hemoglobin rose to 10.5 g/dL without further need for transfusion, supporting the hypothesis that imatinib contributed to the pathogenesis of GAVE in this patient.

DISCUSSIONS

Gastric antral vascular ectasia (GAVE) is a relatively rare but clinically significant cause of upper gastrointestinal (GI) bleeding (Peng *et al.*, 2021). Endoscopically, GAVE is characterized by longitudinally dilated vessels in the gastric antrum, resembling a “watermelon stomach”. Its clinical manifestations range from chronic iron-deficiency anemia due to slow, persistent bleeding to acute hemorrhage requiring blood transfusion. In clinical management, patients presenting with suspected upper GI bleeding should be approached systematically, beginning with hemodynamic stabilization, fluid resuscitation, and early endoscopic evaluation, as outlined in the clinical decision-making flowchart Figure 1 (Swifee *et al.*, 2025).

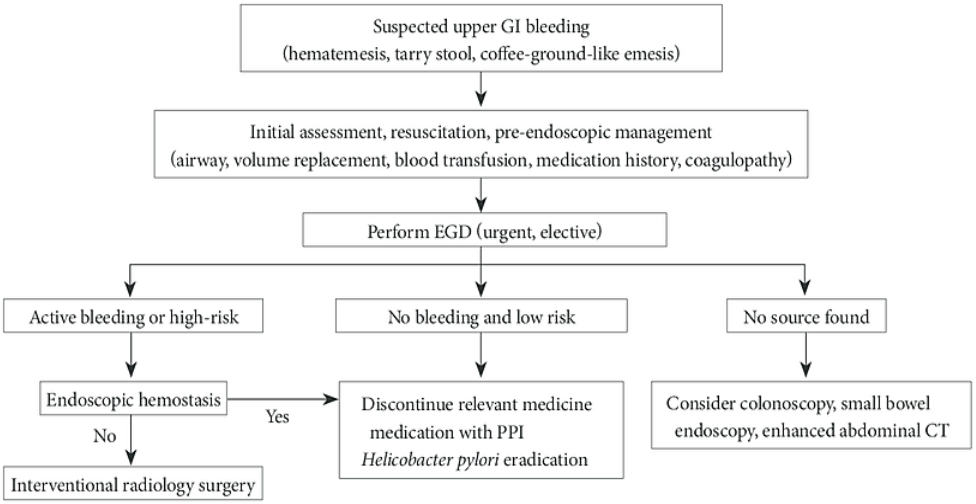

Figure 1. Clinical Algorithm for the Initial Evaluation and Management of Suspected Upper Gastrointestinal Bleeding.

The pathophysiology of GAVE remains incompletely understood. Several studies have implicated elevated levels of vasoactive substances—such as gastrin, serotonin, prostaglandin E2, and vasoactive intestinal peptide (VIP)—in the development of abnormal mucosal vascular proliferation (Peng *et al.*, 2021). Additionally, impaired antral motility and localized mechanical stress have been proposed as contributing factors (Jariwala and Shoreibah, 2021). GAVE is commonly associated with systemic conditions such as liver cirrhosis, autoimmune diseases, and chronic kidney disease (Cavallaro *et al*., 2024). However, in hematologic patients, drug-induced etiologies and primary myeloproliferative disorders must be considered as potential triggers. Imatinib mesylate (IM), a first-line tyrosine kinase inhibitor (TKI) for CML and GIST, has been reported in the literature as a possible cause of GAVE (Abu-Amna et al., 2016). In GIST patients, GI bleeding is more often attributed to imatinib-induced tumor necrosis. In contrast, approximately 4–5% of CML patients treated with IM may experience GI bleeding, possibly due to a local irritant effect on the gastrointestinal mucosa. Although the molecular mechanisms remain unclear, several case reports have demonstrated clinical improvement following IM discontinuation, supporting its role in GAVE pathogenesis (Mohanavelu *et al*., 2021; Inoue *et al.*, 2022).

In the three cases presented, a consistent temporal relationship was observed between IM administration and the onset of GAVE. All patients developed GI bleeding after several months of IM therapy, with significant clinical and endoscopic improvement following drug cessation. Two patients were transitioned to nilotinib as an alternative TKI, and no recurrence of bleeding was noted post-switch. Follow-up endoscopy confirmed regression of GAVE lesions, reinforcing the suspected causal link between IM and GAVE. This aligns with the clinical algorithm, which recommends discontinuation of relevant medications and supportive therapy with PPIs in low-risk or non-bleeding cases (Peng *et al*., 2021).

For patients presenting with active bleeding and endoscopic evidence of GAVE, therapeutic endoscopic interventions such as cauterization are the primary approach, as indicated in the Figure 1. If endoscopic therapy fails, interventional radiology or surgical options may be considered (Singhal *et al*., 2019; Cavallaro *et al*., 2024). However, in cases with a clear drug-related etiology, discontinuing the offending agent and switching to an alternative therapy has proven to be both effective and low-risk. Supportive measures such as PPI administration and blood transfusion remain essential during the acute phase but are insufficient to prevent recurrence if the underlying trigger is not addressed (Baik *et al*., 2024).

These findings underscore the importance of a multidisciplinary approach in managing hematologic patients with GI complications. Comprehensive evaluation—including medication history, hematologic status, and endoscopic findings—is critical in determining the etiology and guiding appropriate treatment strategies. Further research is needed to elucidate the molecular mechanisms linking IM to GAVE and to develop more specific clinical guidelines for TKI-associated GI toxicity. Prospective studies with larger sample sizes and vascular biomarker analysis may help clarify causality and strengthen evidence-based recommendations.

CONCLUSION

This case highlights the potential association between IM therapy and the development of GAVE in hematologic patients. A consistent temporal relationship was observed between IM administration and the onset of gastrointestinal bleeding, with clinical and endoscopic improvement following drug discontinuation. Switching to alternative tyrosine kinase inhibitors, such as nilotinib, prevented recurrence and confirmed regression of GAVE lesions. These findings emphasize the importance of considering drug-induced etiologies in patients with upper GI bleeding, conducting thorough medication history reviews, and adopting a multidisciplinary approach to management. Further prospective studies are warranted to clarify the molecular mechanisms underlying TKI-associated GAVE and to establish evidence-based clinical guidelines.

REFERENCE

1. Abu-Amna M, Awadie H, Bar-Sela G. Imatinib-induced gastrointestinal vascular ectasia in a patient with advanced GIST: case report and literature review. Anticancer Res. 2016; 36(11):6151-4. doi:10.21873/anticanres.11206.
2. Baik M, Jeon J, Kim J, Yoo J. Proton pump inhibitor for gastrointestinal bleeding in patients with myocardial infarction on dual-antiplatelet therapy: a nationwide cohort study. J Epidemiol Glob Health. 2024; 14(3):1142-51. doi:10.1007/s44197-024-00267-9.
3. Cavallaro A, Zanghì A, Di Vita M, Catania VE, Longo G, Lo Menzo E, Granata R, Valenti MR, Cappellani A, Di Majo S. Recurrent gastric antral vascular ectasia: a single center experience. Front Surg. 2024; 11:1356409. doi:10.3389/fsurg.2024.1356409.
4. Hsu WH, Wang YK, Hsieh MS, et al. Insights into the management of gastric antral vascular ectasia (watermelon stomach). Ther Adv Gastroenterol. 2018; 11:1756283X17747471. doi:10.1177/1756283X17747471.
5. Inoue A, Ota S, Yamasaki M, Batsaikhan B, Furukawa A, Watanabe Y. Gastrointestinal stromal tumors: a comprehensive radiological review. Jpn J Radiol. 2022; 40(11):1105-12. doi:10.1007/s11604-022-01305-x.
6. Jariwala R, Shoreibah M. An unexpected association: might GAVE pave the way to how the metabolic syndrome behaves. Clin Liver Dis (Hoboken). 2021; 18(6):297-300. doi:10.1002/cld.1156.
7. Mohanavelu P, Mutnick M, Mehra N, White B, Kudrimoti S, Hernandez Kluesner K, Chen X, Nguyen T, Horlander E, Thenot H, Kota V, Mitchell CS. Meta-analysis of gastrointestinal adverse events from tyrosine kinase inhibitors for chronic myeloid leukemia. Cancers (Basel). 2021; 13(7):1643. doi:10.3390/cancers13071643.
8. Narukawa K, Kakihana K, Fujiwara T, Kobayashi T, Doki N, Sakamaki H, Ohashi K. Gastric antral vascular ectasia during the treatment of chronic myelogenous leukemia with imatinib mesylate. Intern Med. 2016; 55(1):69-72. doi:10.2169/internalmedicine.55.4166.
9. Peng M, Guo X, Yi F, Shao X, Wang L, Wu Y, Wang C, Zhu M, Bian O, Ibrahim M, Chawla S, Qi X. Endoscopic treatment for gastric antral vascular ectasia. Ther Adv Chronic Dis. 2021; 12:20406223211039696. doi:10.1177/20406223211039696.
10. Singhal S, Uthappa MC. Intra-arterial embolization as a treatment option in a case of GAVE syndrome. J Clin Interv Radiol ISVIR. 2019; 4:51-4.
11. Swifee EYM, Osman OA, Abdel-Malek MO, et al. Safety and efficacy of endoscopic band ligation versus argon plasma coagulation in management of gastric antral vascular ectasia: randomized clinical trial. Egypt J Intern Med. 2025; 37:35. doi:10.1186/s43162-025-00423-y.
12. 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; 3(4):254-9. doi:10.14218/JCTH.2015.00031.