Case study

Duodenal Dieulafoy's Lesion - Arising Awareness of this Rare Cause of Gastrointestinal Bleed

Abstract:

Aim: To increase awareness of duodenal dieulafoy lesion (DL) and their risk of bleeding. Also to further encourage using imaging modalities if suspecting bleeding from a DL.

Presentation: This case study reports a 68-year-old male who presented with non-bloody vomiting and multiple episodes of hematochezia. An angiogram revealed active bleeding in the duodenum, which was subsequently identified and treated on the first attempt during endoscopy as a bleeding duodenal DL.

Discussion: DLs are a rare cause of gastrointestinal bleeding, characterized by dilated submucosal vessels that have a tortuous path, making them susceptible to erosion. DLs are most commonly found in the stomach, and are extremely rare in the duodenum, often requiring multiple endoscopic attempts to identify and treat. We were able to successfully treat our patient upon the first attempt with the help of angiogram prior to endoscopy. Use of multiple methods of achieving hemostasis (epinephrine injection, heat probe, and hemoclips) is effective in treating DLs.

Conclusion: DLs have to be recognized as a potential source of gastrointestinal bleed, as their mortality rate is high. Multiple attempts of endoscopies can potentially be avoided with the use of imaging prior to the procedure.

Keywords: Dieulafoy's lesion, gastrointestinal bleed, hemostatis, duodenum

Introduction:

Acute upper gastrointestinal (GI) bleeding is a medical emergency that can lead to unstable hemodynamic status and put patients at risk for significant morbidity and mortality if not promptly diagnosed and managed. The upper GI tract, which includes the esophagus, stomach, and duodenum, is a common source of bleeding, and rapid blood loss from these sites can cause hemodynamic instability, leading to shock and even death in some cases. Peptic ulcer disease is the most common cause of upper GI bleed, accounting for approximately 50% of all cases, while bleeding from Dieulafoy's lesions (DL) accounts for only 1-2% of acute GI bleeding[1].

Dieulafoy's lesions (DLs), also called "calibre persistent artery," are abnormally dilated and exposed vessels in the submucosal layer of the gastrointestinal (GI) tract that protrude through a small puncture in the overlying normal mucosal tissue[2]. These lesions are most commonly located in the proximal stomach within 6cm of the gastroesophageal junction, but can rarely, about 15% of the time, be found in the duodenum[1]. The rarity of Dieulafoy's lesion can be attributed to the lack of awareness about its existence. However, this lack of awareness can lead to a previously reported mortality rate of up to 80% associated with this lesion [3]. This

paper aims to increase awareness of Dieulafoy's lesion as a significant cause of gastrointestinal bleeding by presenting a case of a patient with bleeding from a duodenal lesion.

Case Presentation:
This is a 68 year old male with a past medical history of atrial fibrillation on rivaroxaban, hypertension, chronic nonsteroidal anti-inflammatory medication (NSAID) for back pain, presented with dizziness, nonbloody nonbilious vomiting and multiple episodes of hematochezia. On arrival, his vitals are, blood pressure 156/73 mmHg, heart rate 125 bpm, temperature 37.4 C, and saturating 99% on room air. On examination, the patient had orthostatic hypotension. Labs were significant for Prothrombin (PT) 26.2 seconds, International normalized ratio (INR) 2.28, hemoglobin 10.6 g/dL (no known baseline), white blood cells 12.5 x 10^9/L with 79% neutrophil percent, blood urea nitrogen 61 mg/dL and creatinine 1.59 mg/dL. Computed Tomography Angiogram (CTA) of abdomen and pelvis revealed active extravasation into the duodenum from a branch of the gastroduodenal artery **(Figure 1)**.

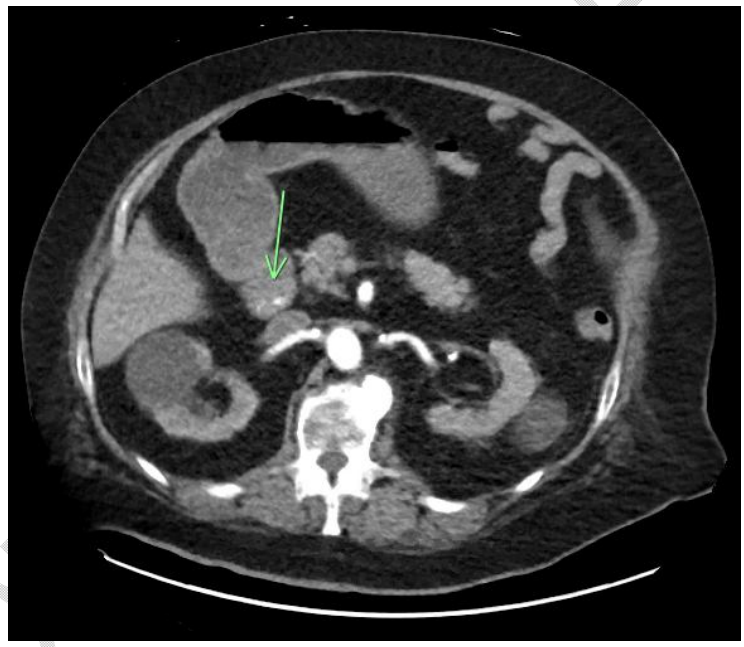

Figure 1: Active extravasation (green arrow) from the gastroduodenal artery into the second part of duodenum

Patient was started on a proton pump inhibitor (PPI) drip, xarelto was stopped, given 2 units of packed red blood cells (PRBC), and was admitted to Intensive Care Unit (ICU) for further monitoring. In the ICU, he continued to have multiple episodes of hematochezia and hemoglobin dropped to 7.9 g/dL. He received another 3 units of PRBCs and 2 units of fresh frozen plasma (FFP). Patient underwent emergent esophagogastroduodenoscopy (EGD) which revealed a single Dieulafoy lesion (DL) with bleeding found in the second portion of duodenum **(Figure 2a, 2b)**.

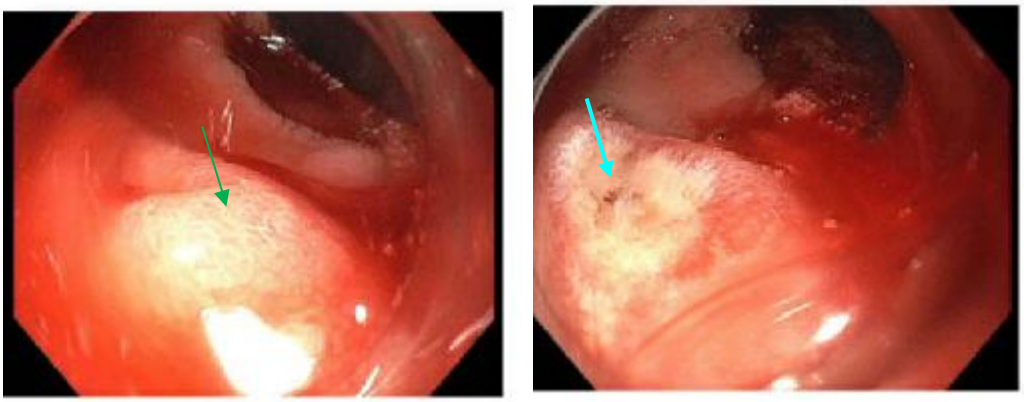

Figure 2a/2b: 2a: Large tortuous Dieulafoy's lesion identified (green arrow). **2b:** Dieulafoy's lesion in the second position of duodenum with active bleeding (blue arrow).

The bleeding was successfully addressed with injection with epinephrine, cauterization with bipolar probe, and placement of hemostatic clip. Hemoglobin levels were stable after the procedure, and the patient was discharged on PPI twice daily and restarted on rivaroxaban seven days after the EGD.

Discussion:

DLs are protruding large blood vessels found in the submucosal layer that maintain a tortuous course and protrude through a submucosal wall defect [2]. Although DLs are a rare cause of gastrointestinal bleeding [4], they can result in significant morbidity and mortality. The majority of DLs are located on the lesser curvature of the stomach, while those within the duodenum only constitute 15% of cases. Identifying and treating a bleeding duodenal DL can be challenging, often requiring multiple endoscopic attempts. This paper reports the case of a patient who experienced massive GI bleeding from a single DL found in the second portion of the duodenum. The patient underwent an EGD, and the bleeding DL was successfully treated on the first attempt.

Bleeding from DLs is typically painless and can present with various symptoms depending on the location. Duodenal DLs are mostly associated with hematemesis, whereas jejunal DLs present with melena [5]. In the case of our patient, they presented with nonbloody emesis and multiple episodes of hematochezia. The presence of hematochezia suggests rapid blood loss from the duodenal DL, with brisk movement throughout the small and large colon.

The extent of blood loss is further supported by the positive physical exam finding of orthostatic hypotension. Orthostatic hypotension is often seen with blood volume loss of at least 15%. Supine hypotension would indicate a blood volume loss of at least 40%, which was not present in our patient. Therefore, it is likely that the patient experienced between 15-40% loss of blood volume, which required a total transfusion of five units of PRBCs within half a day.

It is important to note that the patient's risk of bleeding was further increased by their chronic use of NSAIDs and rivaroxaban.

Given the risk factor of chronic NSAIDs use, it is essential to distinguish between DLs and peptic ulcers. DLs are often found in patients with a history of NSAIDs use, and concomitant peptic ulcer disease is reported in 11% of patients [6]. Histologically, DLs are characterized by normal mucosa without inflammatory cell infiltration, although biopsies are rarely relied upon clinically [1]. DLs can be identified through endoscopic parameters which include: 1) the presence of active arterial spurting or micropulsative streaming from a small mucosal defect or through the surrounding normal mucosa; 2) visualization of a protruding vessel, with or without active bleeding, within a small mucosal defect or through the surrounding normal mucosa; and/or 3) the presence of fresh, tightly adherent clot(s) that are attached to a small mucosal defect or normal appearing mucosa at a narrow point [7]. However, identifying and treating bleeding duodenal DLs can be challenging due to the small size of the lesion, normal-appearing mucosa, and intermittent nature of the bleeding [1]. In our report, the patient's DL lesion was successfully identified and treated on the first endoscopic attempt, likely due to the aid of CTA, which identified active extravasation from the branch of the gastroduodenal artery. Most cases with bleeding from DLs undergo emergency evaluation by colonoscopy or endoscopy [5]. While the use of angiography, red cell scanning, and capsule endoscopy is questionable due to the sporadic character of the bleed [1], angiography was essential in identifying the location of the bleed and providing important information for the endoscopist in our patient's case. Therefore, the bleeding DL was recognized within one endoscopic attempt.

Before 1990, mortality rates from DLs were high and surgical treatment was often necessary [8]. Since then, endoscopic treatments such as injection of epinephrine, rubber band ligation, hemoclips, bipolar electrocoagulation, and laser therapy have been developed and used [1]. Among these, epinephrine injection combined with a heat probe is considered the optimal treatment method for duodenal DLs [9]. However, newer studies suggest that band ligation and hemoclipping are superior to injection therapy for not only controlling the bleed but also preventing recurrent bleeding [10]. In this case, we utilized a combination of epinephrine injection, heat probe, and hemoclipping to control the active bleeding from the duodenal DL in our patient. We believe that this combination of endoscopic therapies contributed to the successful control of the active bleeding DL and further prevention of rebleeding in our patient.

Conclusion

Recognizing the different causes of gastrointestinal (GI) bleeding is crucial for prompt and effective management. However, bleeding from Dieulafoy's lesions (DLs) is often overlooked and has been associated with high mortality rates. While DLs in the duodenum are rare, they can be often controlled with multiple attempts of endoscopy. Our paper highlights the importance of imaging before undergoing endoscopy, particularly if the patient is clinically stable, to increase the likelihood of successful first-attempt management of the bleeding DL.

Informed consent: Informed consent was obtained from the patient for publication of this case report

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