Dieulafoy’s lesion: new diagnosis using high-definition endoscopy and treatment with isoamyl-2-cyanoacrylate (Amcrylate)
Abd Elrazek M. Ali Abd Elrazek\textsuperscript{a,}\textsuperscript{*}, Mohammad Fakhry\textsuperscript{a}, Aly Ragab\textsuperscript{b}, Khaled Abd Elazeem\textsuperscript{a}

\textsuperscript{a}Department of Gastroenterology and Hepatology (Tropical Medicine), Faculty of Medicine, Al-Azhar University, Assiut, \textsuperscript{b}Department of General Surgery, Faculty of Medicine, Al-Azhar University, Cairo, Egypt

\textsuperscript{*}Correspondence to Abd Elrazek M. Ali Abd Elrazek, PhD, MD; Liver Transplantation, Department of GIT, Aswan Faculty of Medicine, Aswan University, Egypt
e-mail: ahmadrazek@gmail.com

Received 10 November 2015
Accepted 01 January 2016

Al Azhar Assiut Medical Journal 2016, 14:11–3

Introduction

Dieulafoy’s lesion (DL) was first described in 1884 by Gallardéen, but was named after the French surgeon George Dieulafoy, who described its characteristics in three patients in 1898 [1,2]. Usually, DL describes a tortuous, submucosal artery in the gastrointestinal (GI) tract, most commonly the posterior stomach, which penetrates through the mucosa over time, eventually perforating to cause severe GI bleeding. Due to its insidious onset, tendency to cause intermittent but severe bleeding, and difficulty of endoscopic diagnosis, DL has a very high mortality rate. Although originally thought not to be a radiologically diagnosable entity, in many situations the etiology is still unknown, but patients who bleed from DL are typically male with comorbidities such as hypertension, diabetes, or alcohol abuse. Use of NSAIDs is also common among patients with bleeding, although many patients have no triggering factors. DLs can appear at any time between 20 months and 92 years of age [3], and can occur in any part of the GI tract, with a tendency toward the lower end of the esophagus, cardia, lesser curvature of the stomach, and cecum [4].

Upper endoscopy is the preferred method for DL diagnosis during acute bleeding. The lesion resembles a raised nipple or visible vessel in the absence of active bleeding. The aberrant vessel is often not visible during massive hemorrhage, but active arterial pumping can be visualized in an area without an associated ulcer or mass lesion [5].

Endoscope resolution has increased in recent years. Modern Fujinon endoscopes have a charge-coupled device pixel density of 650 000 pixels, whereas the charge-coupled device pixel density of standard-definition scopes is only 410 000 pixels. Acquiring high-definition scopes has received increasing attention in the area of advanced endoscopy. High-definition endoscopes with Fujinon intelligent chromoendoscopy (FICE) are used to enhance mucosal microvascular architecture [6].

Case report of three patients

The first patient, a 29-year-old man, was admitted with hematemesis. He denied having taken medications for any illness, and no abnormalities were detected on ultrasound examination. Conventional gastroesophagoduodenoscopy revealed no masses, ulcers, varices, or lesions. Six hours later, the patient developed massive hematemesis. Upper endoscopy was repeated, but no lesion was seen. The patient was referred to a highly-specialized endoscopy center where endoscopy was performed by an experienced endoscopist using both a conventional system and a high-definition FICE approach. FICE was helpful in identification of a nipple-like protrusion on the greater
The second patient, a 72-year-old man, developed massive hematemesis and hypovolemic shock. His management was challenging and the bleeding site could not be identified during conventional upper endoscopy. He was not fit for general anesthesia. Endoscopy was repeated using FICE, which revealed a depressed lesion (DL in the antrum).

The third patient was male patient 52 years old who developed severe abdominal pain accompanied with hematemesis. Patient was admitted in ICU because of hypovolemic shock. Upper endoscopy revealed a nipple-like protrusion in lesser curvature of the stomach just 4.5 cm from the cardia (DL in the lesser curvature of the stomach). It is clear from these reports that FICE should be helpful in the diagnosis of DL (Figs. 1 and 2).

All patients underwent endoscopic sclerotherapy with 1 ml of Amcrylate (Concord Drugs Ltd, Hyderabad, Telangana, India) diluted in 1 ml of lipidol (1:1 ratio). The bleeding stopped, and follow-up 2 months later showed no complications due to therapy and no extravasations, ulcerations, or any other hemostatic disorders. All patients received general anesthesia of intravenous propofol in a dose of 0.1 mg/kg; no complications were reported accordingly. All patients provided informed consent.

Discussion
Although the rate of mortality from GI bleeding episodes has decreased with improved endoscopic and radiologic techniques together with new pharmacologic therapies, the 20 to 30% mortality rate means that bleeding from GI bleeding remains clinically important. There are no guidelines regarding effective selective therapy for DL. When diagnosed, the endoscopist relies on experience as the major determinant of the treatment strategy. There are many therapeutic approaches, including endoscopic hemostasis with a combination of epinephrine followed by bipolar probe coagulation, heater probe thermocoagulation, hemoclip placement, band ligation, argon plasma coagulation, arterial angiographic embolization, endoscopic sclerotherapy using ethanolamine oleate, polidocanol, or n-butyl-2-cyanoacrylate, and surgical wedge resection of the lesion, which is rarely performed because of the availability of more advanced endoscopic technologies and increased operator experience [7,8]. Cyanoacrylate adhesives are compounds known as alkyl-cyanoacrylates that polymerize on contact with basic substances such as blood or water. Cyanoacrylate is superior to sutures and is clinically popular due to ease of application, decreased scarring, decreased pain, and better cosmetic results without snagging the clothing or dressing after surgery [9].

Several studies have reported disadvantages of n-butyl-2-cyanoacrylate for treating DL because of serious complications including massive ulceration and gastric perforation [10–12]. At this moment, there are very few reports regarding the use of isoamyl-2-cyanoacrylate (Amcrylate) to treat DL [13]. Diagnosis using Fuji intelligent color enhancement, a recently developed noninvasive virtual hromoendoscopic system, can explore the entire mucosal surface (of structures and vessels), which allows a faster, easier, and simpler analysis than does conventional endoscopy. It is possible to assess capillary and surface patterns of gastric lesions.
We previously experienced serious complications of n-butyl-2-cyanoacrylate, when used during endoscopic therapy for DL and other gastric varicose lesions. Amcrylate is a more effective treatment because it shows reduced viscosity and adhesive problems compared with n-butyl-2-cyanoacrylate. Amcrylate is also significantly more cost-effective than is n-butyl-2-cyanoacrylate, especially when large amounts are required. Rebleeding usually occurs when applying ethanolamine oleate.

According to our past experience, when an obscured GI lesion is suspected, an expert endoscopist with a skilled assistant and nurse should have a high rate of successfully diagnosing DL. Virtual chromoendoscopy using FICE was a useful tool for identifying gastric DL in the three cases described here. Amcrylate seems an effective and safe endoscopic therapy for DL compared with other strategies, including ethanolamine oleate and n-butyl-2-cyanoacrylate. Surgical wedge resection of the lesion should be considered as a therapeutic option if endoscopic therapy fails. We prefer induction of GI endoscopy procedures using propofol, both in diagnostic and/or therapeutic approaches. Propofol has been widely used for an induction and/or maintenance of general anesthesia with few side effects or complications reported.

**Conclusion**

Our case study revealed that DL can occur in any age, and is more dominant in men. Primary hemostasis with endoscopic intervention using Amcrylate is safe, successful, and cost-effective.

**Limitation of the study**

Given the small sample size, we recommend further studies involving more patients with comparative therapeutic evaluation.

Clinical experience played a major role in assessing the diagnosis and management of DL, and therefore guidelines regarding effective selective therapy should be considered.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**