

## CASE REPORT

### Duodenal diverticular bleeding: an endoscopic challenge

Eduardo Valdivielso-Cortázar, Lucía Madarnás-Alonso, Susana Ortiz-Marín, Ignacio Couto-Wörner and Pedro Alonso-Aguirre

Service of Digestive Diseases. Complejo Hospitalario Universitario de A Coruña. A Coruña, Spain

#### ABSTRACT

Duodenal diverticula are an uncommon cause of upper gastrointestinal bleeding. Until recently, it was primarily managed with surgery, but advances in the field of endoscopy have made management increasingly less invasive. We report a case of duodenal diverticular bleeding that was endoscopically managed, and review the literature about the various endoscopic therapies thus far described.

**Key words:** Bleeding. Duodenal diverticula.

#### CASE REPORT

We report the case of an 80-year-old woman who presented to the Emergency Room (ER) with asthenia of a four-day duration associated first with melena and then overt rectorrhage and coffee-ground vomiting. She denied having taken any gastrolesive drugs. During her stay at the ER she had an episode of hypotension. An urgent blood test was ordered, which revealed anemia (Hb: 7 g/dl), requiring two red blood cells concentrates (RBC) concentrates. In view of her clinical status, an emergency gastroscopy was performed, which showed reduced blood remnants inside the gastric chamber. Fresh blood residue was found within the bulb and second portion of the duodenum. Following profuse washing, a duodenal diverticulum with blood-dribbling from the bottom was identified distal to the papilla. With some difficulty because of an unstable gastroscope, 4 cc of diluted adrenaline were injected, which stopped the bleeding. After 24 hours, the patient had a second episode of hypotension and her blood tests revealed further anemia (Hb: 6.5 g/dl), hence an emergency endoscopy was again performed. The gastroscope was advanced to the already identified diverticulum and, with improved accessibility and stability, an additional 4 cc injection of diluted adrenaline was performed. As minimal bleeding persisted, the lesion was then coagulated with argon gas. Following this

procedure (Fig. 1) and the transfusion of two additional RBC concentrates, the patient remained stable with no relapses, and was discharged after five days. No further bleeding has since developed after three months follow-up.

#### DISCUSSION

The prevalence of duodenal diverticula, usually single lesions, reached 22% in an autopsy series (1). In most cases, duodenal diverticula are found in the second portion of the duodenum as periampullary lesions. Gender predisposition remains unclear, and the condition usually

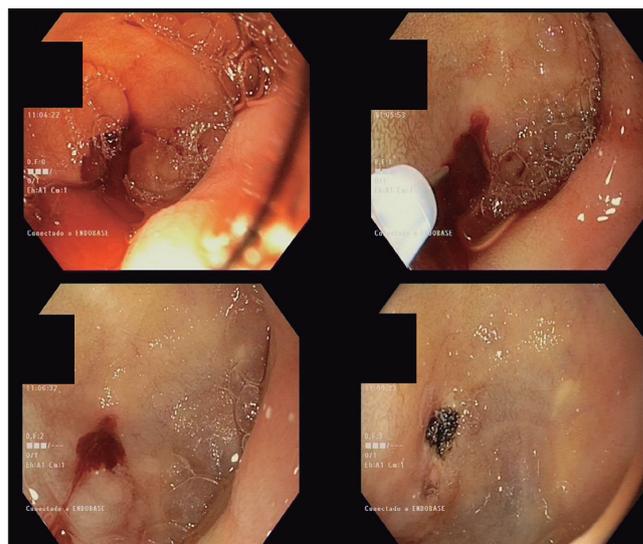


Fig. 1. The upper left picture shows the actively bleeding lesion. The procedure to inject diluted adrenaline is captured in the upper right panel. The bleeding persisting after the initial injection may be seen in the lower left image, whereas the lower right image illustrates hemostasis as achieved with argon following the second injection.

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Correspondence: Eduardo Valdivielso Cortázar. Service of Digestive Diseases. Complejo Hospitalario Universitario de A Coruña. C/ As Xubias, 84. 15006 A Coruña, Spain  
e-mail: evaldiviels@alumni.unav.es

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involves individuals of 50-60 years of age. Primary complications include perforation, surgical management, and diverticular bleeding, with diverticula being responsible for 0.14% of upper gastrointestinal bleeding (2).

Until recently, surgery was the primary method of therapy for bleeding originating in duodenal diverticula (3), but advances in the field of gastroenterology now allow a more conservative approach. The first challenge an endoscopist must face when presented with bleeding of a duodenal diverticulum is identifying where the blood is coming from. In our case, it was identified using a conventional gastroscope but not without difficulty, although side-view endoscopes and enteroscopes may also be helpful. Once the origin has been identified, no gold-standard endoscopic management exists. In a series of 23 cases of duodenal diverticular bleeding, the approaches used in order of frequency included injection methods (hypertonic saline and adrenaline or 1% polydocanole), thermal strategies, mechanic measures, and combined therapy (2). Diluted adrenaline provides an initial success in 80-100% of bleeding events secondary to ulcers, but rebleeding rates amount to 6-36% (4); in vascular lesions, the effects may be transient, as in our patient. We should bear in mind the special characteristics of the area where therapy will be delivered, usually an area of limited accessibility and thinner walls. Both these features render endoscopic therapy a high-risk procedure when compared to other locations. Indeed, perforations have been reported in association with the use of hemoclips for diverticular bleeding (2), which may result from the clip end rubbing the diverticular wall and/or excessive insufflation (5). Pneumoperitoneum has also been reported in association with the use of argon gas to seal vascular lesions (6), hence therapy must always be delivered with extreme caution. In our case, argon plasma was selected since clip placement was deemed more risky because of gastroscope instability at this level. Clinically successful endoscopic treatments using the over-the-scope clip (OTSC) technique have been reported, albeit with bleeding coming from the edge rather than the bottom of the diverticulum, which may entail a lower risk of perforation (7). Rescue therapy has also been reported with cyanoacrylate, which is not a risk-free option and may entail complications such as systemic embolization, which has a poor prognosis (8). Other options described in the literature include hemostatic forceps (Coagrasper,

FD-410LR; Olympus, Tokyo, Japan), usually employed for intra-procedure bleeding control during endoscopic submucosal dissection. In such a case, it is vitally important that blood vessels be correctly pinched with the forceps to prevent complications arising from excessive clotting (9).

In cases of failed endoscopic treatment, the use of transcatheter arterial embolization has been described. Bleeding rates must reach at least 0.5-1.0 ml/min. to be detected by arteriography, and coils, gelatin sponges or liquid embolic agents may be used for embolization. Although a safe, effective technique, this modality is in no way exempt from risks, and cases of duodenal obstruction or ischemia as well as pancreatitis have been reported secondary to embolization. Relative contraindications include renal failure, coagulopathy, and contrast allergy (10).

At present, surgical management with diverticulectomy has been relegated to a rescue therapy when endoscopic and endovascular treatment fails.

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