



## IMAGES IN GASTROENTEROLOGY AND HEPATOLOGY

## Intraluminal Duodenal (“Windsock”) Diverticulum: A Rare Cause of Gastrointestinal Bleeding



### Divertículo Duodenal Intraluminal (de “Windsock”): Uma Causa Rara de Hemorragia Digestiva

Marta Eusébio\*, André Ramos, Horácio Guerreiro

*Gastroenterology Department, Centro Hospitalar do Algarve, Faro, Portugal*

Received 30 June 2015; accepted 17 July 2015

Available online 1 September 2015

#### KEYWORDS

Diverticulum;  
Duodenal Diseases;  
Gastrointestinal Hemorrhage

#### PALAVRAS-CHAVE

Divertículo;  
Doenças Duodenais;  
Hemorragia Gastrointestinal

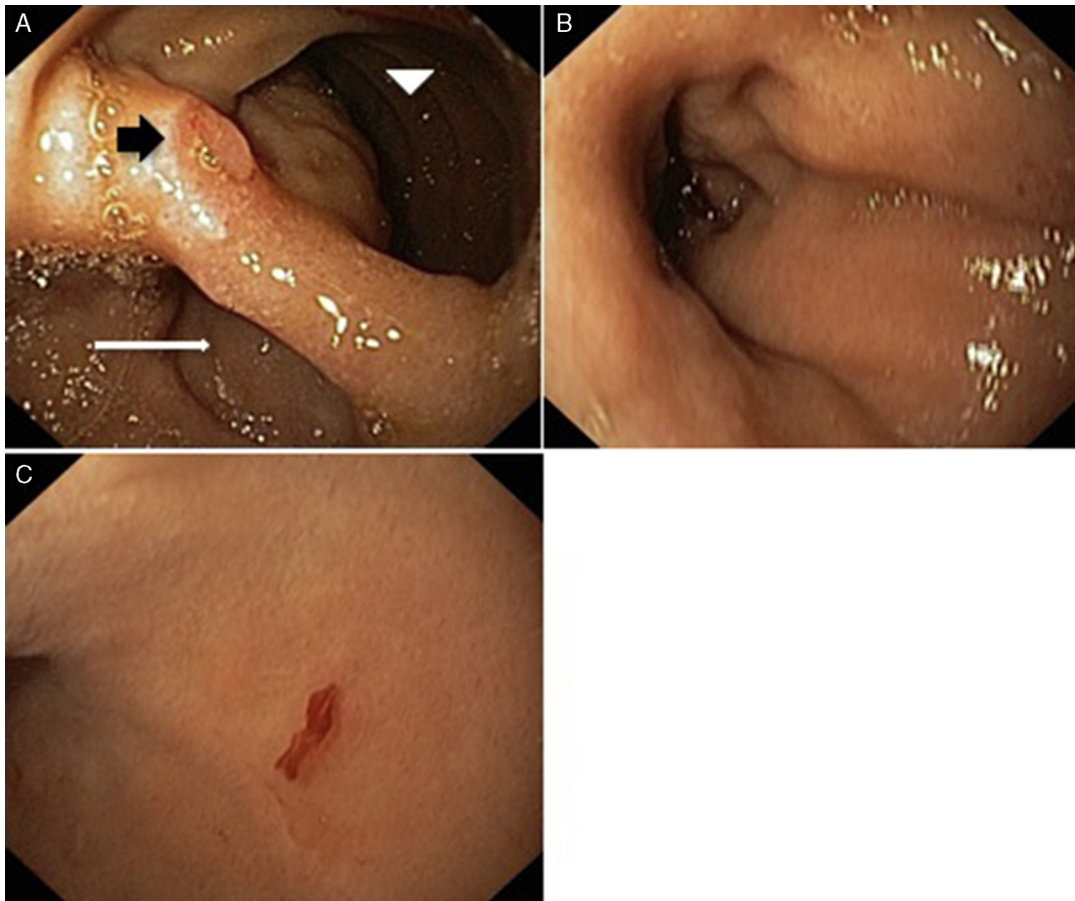
A 67-year-old man was admitted to the emergency department with a recent history of melena and progressive fatigue. He had a past medical history of hypertension, dyslipidemia, ischemic heart disease, chronic renal failure and was on antiaggregation therapy. Physical examination showed pallor and hemodynamic stability. Laboratory work-up revealed normocytic anemia (hemoglobin 9 g/dL; normal: 13–17), elevated blood urea nitrogen (35 mg/dL; normal: 8.4–25.7) and worsened renal failure (creatinine 3 mg/dL

from a baseline of 2.2 mg/dL; normal: 0.7–1.3). Upper gastrointestinal endoscopy demonstrated a double lumen in the second portion of the duodenum corresponding to a large saccular structure surrounded on both sides by duodenal mucosa. Spontaneous oozing of fresh blood was seen from a punctiform, non-ulcerated lesion located in the diverticular mucosa (Fig. 1). No other lesions were endoscopically seen in the upper digestive tract. We admitted a vascular lesion within the diverticulum and argon plasma coagulation was then applied without recurrent bleeding. Subsequent esophagogastroduodenal transit was performed showing a barium filled saccular structure in the second portion of the duodenum extending to the third portion and surrounded by a radiolucent line. These findings confirmed the endoscopic suspicion of a “windsock” diverticulum (Fig. 2). Computed tomography evidenced a bowel loop within another loop consistent with the previous findings and excluded other “major” lesions (Fig. 3). Patient was discharged and did not present further episodes of bleeding, however due to complications of his comorbid disease he died 4 months later.

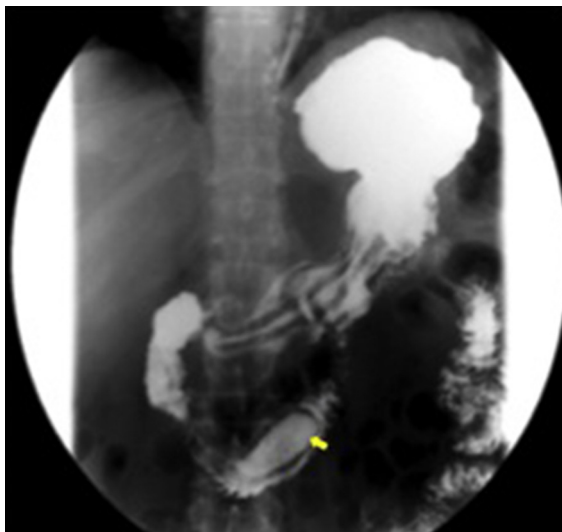
Intraluminal duodenal diverticulum (IDD), also known as “windsock” diverticulum, is a rare congenital abnormality that seems to result from an incomplete recanalization of the foregut lumen.<sup>1,2</sup> Symptoms usually do not appear until the third decade of life.<sup>3,4</sup> When symptomatic, clinical manifestation is nonspecific and consists mainly of epigastric

\* Corresponding author.

E-mail address: [martaeusebio@gmail.com](mailto:martaeusebio@gmail.com) (M. Eusébio).



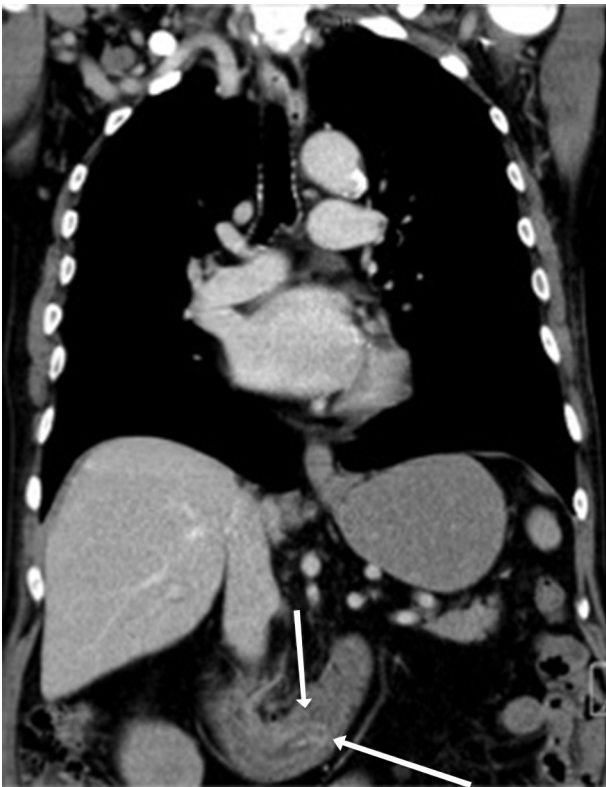
**Figure 1** Endoscopic images of an intraluminal duodenal (“windsock”) diverticulum within the second portion of the duodenum. (A) Duodenum with a double lumen: white arrow – diverticular lumen; arrow head – true duodenal lumen; black arrow – septum with major papilla. (B) Diverticular lumen with apical fresh blood oozing. (C) Punctiform lesion with oozing bleed in the diverticular mucosa.



**Figure 2** Image of esophagogastroduodenal transit with barium showing a barium filled saccular structure (yellow arrow), in the second portion of the duodenum extending to the third portion, surrounded by a radiolucent line which corresponded to the true duodenal lumen.

pain, early satiety, nausea or vomiting.<sup>3,5</sup> Less commonly, IDD may complicate with gastrointestinal bleeding,<sup>1,3,4</sup> pancreatitis or duodenal obstruction.<sup>3</sup> Endoscopic appearance may be challenging: IDD may be collapsed and pass unnoticed, a long sac may be mistaken for the duodenal lumen<sup>3</sup> and an inverted diverticulum may resemble a large polyp.<sup>1</sup> Furthermore, it may be confusing if the endoscopist is not familiar with this rare entity.<sup>1</sup> There are some key elements concerning IDD, which may help to distinguish from extraluminal duodenal diverticulum: (1) both sides of the IDD are lined by duodenal mucosa; (2) there is a diaphragm that crosses the duodenal lumen and forms the intraluminal septum of the diverticulum; (3) there is a separate opening in the diaphragm corresponding to the true lumen.<sup>2</sup>

Definitive treatment has been proposed in symptomatic IDD due to the high recurrence rate of symptoms, except in poor risk patients in whom conservative treatment is an option.<sup>3</sup> Surgical intervention was the traditional treatment, however, endoscopic management has been advocated with a satisfactory outcome.<sup>1,2</sup> Several endoscopic techniques have been described namely diverticulectomy using snare excision or diverticulotomy (using needle devices, argon plasma coagulation or Nd:YAG laser).<sup>2</sup>



**Figure 3** Abdominal computed tomography image (coronal plane) showing the appearance of a bowel loop within another bowel loop (white arrows). This finding, also known as the halo sign, was compatible with an intraluminal duodenal diverticulum.

Given the rarity of this lesion and its form of presentation, the authors present iconography that highlights the characteristic endoscopic findings of this entity that may prompt direct diagnosis.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that no patient data appear in this article.

**Right to privacy and informed consent.** The authors declare that no patient data appear in this article.

## Conflict of interest

The authors have no conflicts of interest to declare.

## References

1. De Castro ML, Hermo JA, Pineda JR, Carreira M, Dominguez F, Clofent J. Acute bleeding and anemia associated with intraluminal duodenal diverticulum: case report and review. *Gastrointest Endosc.* 2003;57:976–9.
2. Law R, Topazian M, Baron TH. Endoscopic treatment of intraluminal duodenal (windsock) diverticulum: varying techniques from five cases. *Endoscopy.* 2012;44:1161–4.
3. Economides NG, McBurney RP, Hamilton FH. Intraluminal duodenal diverticulum in the adult. *Ann Surg.* 1977;185:147–52.
4. Lorente S, Lanas A, Aznar C, Jiménez E, Lozano R. Recurrent digestive hemorrhage as a complication of an intraduodenal diverticulum. *Gastroenterol Hepatol.* 1999;22:282–5.
5. Mathieu B, Salducci J, Remacle J-P, Pin G, Monges H. Intraluminal duodenal diverticulum. *Am J Dig Dis.* 1978;23:S1–5.