Spontaneous perforated duodenal diverticulum: a case series

D. Coevoet[1,2,*], F. Anné [1,2,*], JNL. Schouten[1,2], T. Holvoet[1], B. Naessens[1], W. Verlinden[1,3,4]

(1) Department of gastroenterology and hepatology, AZ Nikolaas, Sint-Niklaas, Belgium and Faculty of Medicine, Ghent University, Ghent, Belgium; (2) Faculty of Medicine, Ghent University, Ghent, Belgium; (3) Faculty of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium; (4) Department of gastroenterology and hepatology, Antwerp University Hospital, Antwerp, Belgium.

Abstract

Perforation is a rare but dangerous complication of duodenal diverticula. The nonspecific presentation makes the diagnosis difficult. Despite mainly treated surgically, recent case reports describe good clinical outcomes after conservative treatment. We present 2 cases of a spontaneous perforated duodenal diverticulum treated conservatively with favourable clinical outcome. (Acta gastroenterol. belg., **2022,** 85, **387-389**).

Keywords: Duodenal diverticulum, complication, perforation.

Introduction

Apart from colonic diverticulum, the duodenal diverticulum is the most common gastro-intestinal diverticulum, found in up to 22% of autopsies and endoscopic retrograde cholangiopancreatographies (ERCP) (1). Duodenal diverticula are generally asymptomatic. Only 1-5% are symptomatic and can express as haemorrhage, diverticulitis, jaundice and cholangitis; with perforation being the rarest but also the most dangerous complication with the highest mortality rate (ranging from 8 to 34%) (2). We report a case series of two patients with a spontaneous perforated duodenal diverticulum successfully treated conservatively.

Cases

Case 1

A 57-year-old man was referred by his general practitioner due to right upper abdominal pain, eradiating to the lumbar region and anorexia to exclude pyelo-nephritis. He had no medical history apart from migraine. On clinical examination the patient was haemodynamically stable and had signs of localised peritonitis in the right upper quadrant and tenderness on the right costophrenic angle. Laboratory test results showed leucocytosis of 22.800/mm³, a creatinine of 1,57 mg/dL and an elevated CRP of 263 mg/L. Computed tomography (CT) of the abdomen with intravenous contrast showed a perforated duodenal diverticulum in segment DIII, without signs of diverticulitis (Figure 1). The patient was treated conservatively (6 days of bowel rest, proton pump inhibitors, intravenous fluids and antibiotics) with a favourable clinical and biochemical (CRP 10 mg/L) evolution. A control CT with peroral contrast after 4 weeks revealed no free extraluminal air or contrast leakage through the diverticulum. So far, no perforation recurred.

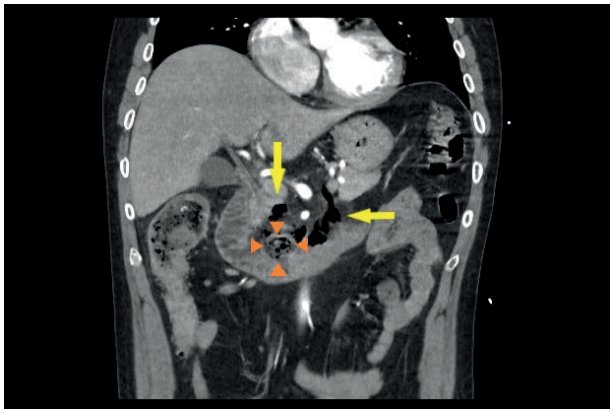

Figure 1. — CT of the abdomen showing a perforated duodenal diverticulum (orange triangles) at the third portion of the duodenum with extra-intestinal air (yellow arrow).

Case 2

A 52-year-old woman without medical history presented at the emergency department with acute intense epigastric pain without vomiting or nausea. The patient was haemodynamically stable. During clinical examination, diffuse tenderness on palpation and signs of epigastric peritonitis were observed. Blood analysis showed leucocytosis of 21.000/mm³, normal lipase and a CRP of 10 mg/L at presentation. CT of the abdomen showed an exudative pancreatitis with free fluid in the pancreaticoduodenal region and air in the pancreatic duct and common bile duct. Additionally, a periampullary duodenal diverticulum with a focal irregular wall was seen with extra-intestinal air at the region of the pancreaticoduodenal groove (Figure 2). During first days of admission, the patients CRP and lipase values increased to 257 mg/L and 2029 U/L, respectively. Further work-up revealed no evidence of gallstones, nor

Correspondence to: Coevoet Delfien, Corneel Heymanslaan 10, 9000 Gent, Belgium.
Email: delfien.coevoet@ugent.be
*Both authors contributed equally

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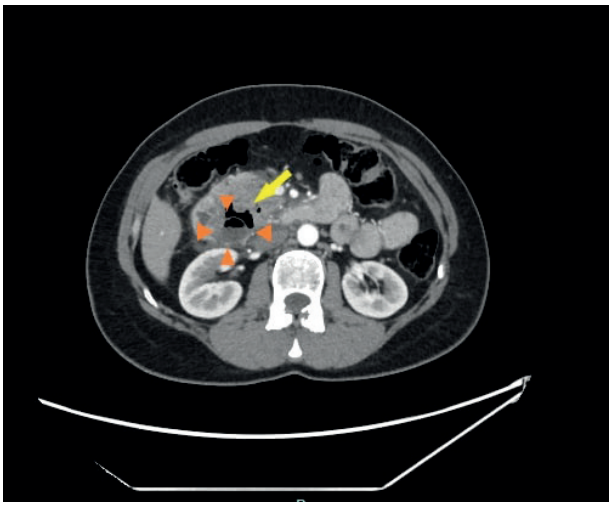

Figure 2. — CT view showing a periampullary duodenal diverticulum (orange triangles) with free extra-intestinal air (yellow arrow).

hypercalcaemia, or hypertriglyceridaemia. In addition, no provoking medication, and a normal IgG4 value were discovered. These findings suggested a perforated periampullary duodenal diverticulum with secondary acute exudative pancreatitis. The patient was treated conservatively (5 days of bowel rest, and use of proton pump inhibitors, intravenous fluids and antibiotics). The patient had a good clinical, biochemical (CRP 10 mg/L) and radiological evolution with resolution of extraluminal air after 3 weeks. Gastroscopy confirmed a healed duodenal diverticulum after 4 weeks.

Discussion

First described by Chomel in 1710, the duodenal diverticulum is a common asymptomatic finding, rarely causing complications. They are mostly situated in the second and third portion of the duodenum along the pancreatic and mesenteric border, commonly within 2,5 cm of the ampulla of Vater. The prevalence of duodenal diverticulum is correlated with increasing age, with an average age of 64 years in the case series of Thorson et al. (2).

Causes of perforation of duodenal diverticulum, reported in literature, are diverticulitis (62%), entero-lithiasis (1%), iatrogenic (5%), ulceration (5%), trauma (5%), foreign bodies and blunt trauma (3). Not-withstanding that spontaneous perforations are rare, no clear aetiology was found in both of our cases and thus they are thought to be spontaneous.

A perforated duodenal diverticulum is a rare com-plication, associated with a high mortality rate. Older case series, such as Juler et al. from 1907 to 1969, including 56 cases, had a mortality rate of 34% (4). More recent case series like Thorson et al. from 1989 to 2011, including 57 cases, report a mortality rate of 8%. Reasons for this decline could be the improvement of surgical techniques, broad spectrum antibiotics, better diagnosis and greater awareness of this complication (2).

Clinical diagnosis of a perforated diverticulum is difficult due to the lack of pathognomonic signs and symptoms and nonspecific presentation like acute abdominal pain in the right upper abdominal quadrant and epigastric region, nausea and vomiting. Literature supports that almost all patients with duodenal perforation experience abdominal pain but only 34% show signs of peritonitis, due to the retroperitoneal localisation of the diverticulum (2). Back pain, like in our first case, can be a possible presentation due to this retroperitoneal localisation. The association with pancreatitis is rare, to our knowledge only 1 case has described the association of acute pancreatitis and a duodenal diverticulum perforation (5). Non-perforated duodenal diverticula, on the other hand, are known to be a possible cause of acute pancreatitis. However, no large case series are reported. Two pathophysiological hypotheses have been formulated with pancreatitis either being caused by reflux of duodenal content into the pancreatic duct, or being secondary to the mass-effect of the distended duodenal diverticulum on the pancreatic duct (6). Other possible complicated presentations are duodenocolic fistula with steatorrhea or gastrointestinal bleeding when perforated into the aorta (7).

Since clinical presentation remains nonspecific, additional radiological work-up is warranted. Plain radiography and ultrasonography have limited utility, as free sub-diaphragmatic air will appear in only 10% of cases, keeping in mind that retroperitoneal perforation will not cause intraperitoneal air (2). The diagnostic tool of choice is CT, which shows a thickened duodenal wall, mesenteric fat stranding and an extraluminal collection of air and fluid, mostly retroperitoneal (8).

Concerning the treatment, no clear guidelines are made due to the limited amount of cases. Conservative management is safe in certain select patients. Candidates are patients with mild symptoms, haemodynamically stable vitals, as well as older patients with multiple comorbidities and patients with a presumed high perioperative mortality. Conservative treatment includes fasting with or without nasogastric suction, intravenous fluid resuscitation, broad spectrum antibiotics, proton-pump inhibitors and parenteral nutrition when prolonged treatment is expected. When intra-abdominal abscesses appear, transcutaneous drainage can be considered (2,3). In case of upper gastro-intestinal ulcer perforation, usually intravenous proton-pump inhibitors are used. However, the evidence of proton-pump inhibitors in case of a spontaneous perforation of a duodenal diverticulum is the absence of an ulcer, is not clear. In case of haemodynamic instability, peritoneal signs and sepsis, surgical treatment is recommended. The type of operative intervention depends on the local inflammation. If limited, diverticulectomy with single- or double-layer closure after Kocher manoeuvre is the favoured approach, with drainage of the retroperitoneal

space. The use of an omental patch is also reported. In case of severe tissue destruction, more advanced surgical procedures can be required, such as a subtotal gastrectomy followed by Billroth II reconstruction, a Roux-en-Y gastroenteroanastomosis or pylorus preserving Whipple procedure (1,2,7).

In recent years, advancements have been made on endoscopic techniques making endoscopic intervention a possibility. To date, there are only few reports regarding this therapeutic option. Eeckhout et al. reported the endoscopic approach to an abdominal abscess due to a perforated duodenal diverticulum. A percutaneous catheter and injection of contrast through the percutaneous drain helped to diagnose a fistula from the retroperitoneal abscess to the diverticulum (9). Endoscopic treatment can be selected not only for direct abscess drainage, but also nasobiliary and nasopancreatic drainage of the cavity (10-12). However more research is necessary on this subject.

In conclusion, a perforated duodenal diverticulum is a rare but serious complication, which is difficult to diagnose clinically. Conservative treatment was reserved for patients with advanced age and multiple comorbidities. Here, however, we present two cases of successful conservative management of a perforated duodenal diverticulum in young patients. Alongside evidence from other case series, this suggests that surgery might not always be mandatory in this age group.

Conflict of interest statement

The authors declare that they have no conflict of interests.

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