CASE REPORT

Perforated duodenal diverticulum: a rare complication in a common condition

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SUMMARY

The authors present a rare case of perforated duodenal diverticulum diagnosed in an 80-year-old Caucasian woman with vomiting and abdominal pain localised to the epigastrium. CT scan showed thickening of the second portion of the duodenum with retroperitoneal fat stranding and perihepatic free fluid, with a presumptive diagnosis of a duodenal perforation. A laparotomy was performed which showed a perforated diverticulum in the second portion of the duodenum. A diverticulectomy with single-layer closure was performed, without complications. The postoperative course was uneventful.

BACKGROUND

Duodenal diverticula are a relatively common finding, nonetheless its perforation is a rare complication with a high mortality. Due to the rareness, they frequently represent a challenge in diagnosis and treatment, with surgery remaining as the most common approach.^{1 2}

CASE PRESENTATION

An 80-year-old Caucasian woman presented to the emergency department with a 3-hour history of epigastric pain and vomiting. Medical history included hypertension and hyperlipidaemia. Physical examination revealed tenderness in the right upper quadrant with absence of peritoneal signs.

INVESTIGATIONS

Laboratory tests were within normal range. CT scan showed fluid and gas surrounding the second and third portions of the duodenum, thickening of the duodenal wall, retroperitoneal fat stranding and perihepatic free fluid, with a presumptive diagnosis of perforated duodenal ulcer (figure 1).

TREATMENT

A laparotomy was decided and showed, after performing a Kocher manoeuvre, a perforated diverticulum in the second portion of the duodenum (figure 2). A diverticulectomy with single-layer duodenal closure was performed, without complications.

OUTCOME AND FOLLOW-UP

The postoperative course was uneventful and the patient was discharged home on the seventh day. The pathological examination confirmed the diagnosis of perforated duodenal diverticulum with evidence of ischaemic damage.

DISCUSSION

Duodenum is the second most frequent location in the digestive tract for diverticular disease. With a reported incidence of 5% in radiological series and up to 22% of endoscopic retrograde cholangiopancreatography (ERCP) and autopsy series, an increase in prevalence is seen with age.^{3–5}

Duodenal diverticula can be congenital or, more frequently, a secondary acquired pseudodiverticula. They involve mostly the second or third portion of the duodenum along the pancreatic or mesenteric border, and commonly near the ampulla of Vater.^{2 3}

Usually asymptomatic, around 5% can present complications, such as haemorrhage, obstruction, compression of biliopancreatic structures, inflammation and perforation.⁶ Perforated duodenal diverticula are a rare complication with only about 200 cases reported in the literature.⁵ It carries a relatively high mortality (8%–34%), and the most common cause is diverticulitis.³ Other identified causes are enterolithiasis, iatrogenic perforation due to ERCP, ulceration, trauma and foreign body. Several authors report an ischaemia due to distention related to intradiverticular food retention as a possible explanation for perforation.^{7 8}

A perforated duodenal diverticulum most frequently represents a challenge in diagnosis. Regardless of their rarity, the lack of specificity of symptoms usually requires a high level of suspicion. Due to a retroperitoneal perforation, it frequently presents with an acute abdominal pain without evidence of peritoneal signs. Other vague and non-specific symptoms, such as fever, nausea and vomiting, may be present as in other conditions, and it can be difficult to distinguish from a perforated peptic ulcer, cholecystitis or pancreatitis.³ The diagnosis can therefore be difficult and an abdominal CT scan, which is described as the most sensitive examination to detect a perforated duodenal diverticulum, can be useful by showing suggestive radiological findings such as thickened bowel wall, mesenteric fat stranding, retroperitoneal abscess and extraluminal fluid and air.^{1 5} However, sometimes an accurate diagnosis can only be established at laparotomy.⁶

With no precise management recommendations, the most common approach has been surgical, with only a few reports of conservative treatment. In selected patients, with a good clinical condition and no evidence of septic signs, a non-operative treatment is an option with antibiotic therapy and bowel rest, supported by parenteral nutrition.^{2 9} This course of treatment should be replaced by surgery if

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Figure 1 CT scan showing a retroperitoneal duodenal perforation.

the patient deteriorates.² As in our case, the standard treatment usually involves diverticulectomy and primary repair with single

Figure 2 Intraoperative image of the perforated duodenal diverticulum at laparotomy.

or double-layer duodenal closure. More complex procedures may be needed such as Whipple's procedure.^{8 10} A laparoscopic approach has also been reported with good results.⁷

The development of a retroperitoneal abscess is a possibility, with the minimally invasive approach as an option of treatment. A percutaneous drainage can possibly avoid a surgical intervention. Other complications have been reported such as duodenal fistula, biliary injury and pancreatitis.³

Learning points

- ▶ A perforated duodenal diverticulum frequently represents a challenge in diagnosis due to the lack of specificity of symptoms.
- ▶ Surgery remains as the most common approach with diverticulectomy and primary repair with single or double-layer duodenal closure.
- ▶ In selected patients, the non-operative treatment is an option.

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