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Perforated duodenal diverticulum: Surgical treatment and literature review

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ABSTRACT

INTRODUCTION: Duodenum is the second most frequent location for a diverticulum in the digestive tract. Complications are rare and perforation was only reported in less than 200 cases.
PRESENTATION OF CASE: A 79-year-old female was admitted to Emergency Department with abdominal pain and vomiting for the last 24 h. A CT scan was performed and moderated extra-luminal air was identified. During surgery a fourth portion perforated duodenal diverticulum was diagnosed and duodenal resection was performed.
DISCUSSION: First reported in 1710, the incidence of duodenal diverticula can be as high as 22%. Nevertheless complications are extremely rare and include haemorrhage, inflammation, compression of surrounding organs, neoplastic progression, cholestasis and perforation.

As perforations are often retroperitoneal, symptoms are nonspecific and rarely include peritoneal irritation, making clinical diagnose a challenge.

CT scan will usually present extra-luminal retroperitoneal air and mesenteric fat stranding, providing clues for the diagnosis.

Although non-operative treatment has been reported in selected patients, standard treatment is surgery and alternatives are diverse including diverticulectomy or duodenopancreatectomy.
CONCLUSION: Perforated diverticula of the fourth portion of the duodenum are extremely rare and current evidence still supports surgery as the primary treatment modality.

1. Introduction

First reported by Chomel in 1710, the incidence of duodenal diverticula (DD) can be as high as 22% and complications can be estimated at 0.03% per year.[1] Duodenum is the second most common site for diverticula in the alimentary tract being the second portion the most frequent location.[2–4]

Perforation is a rare complication of DD, only reported in 162 cases,[5] but also the most serious one,[2] representing a diagnostic challenge,[6] and a difficult surgical problem.

Few cases of perforated third and fourth portions of the DD are reported in literature and so their diagnosis, management and outcomes are based on those reports.

We present a rare case of perforated diverticulum from the fourth part of the duodenum and its successful surgical management.

2. Presentation of case

A 79 years old female patient with dementia, hypertension, mitral insufficiency and paroxysmal atrial fibrillation, is admitted to the Emergency Department with abdominal pain and vomiting for the last 24 h.

On arrival her vital signs showed auricular temperature of 36 °C, heart rate of 73/min and blood pressure of 125/65 mm Hg. Physical examination elicited pain on palpation of the four quadrants without signs of peritoneal irritation. Blood tests showed 28,040 white blood cells/μL with 88% neutrophils in the differential count, haemoglobin value of 13.1 g/dL, platelets count of 259,000/μL, C-reactive protein of 100.23 mg/L, creatinine of 0.94 mg/dL, urea of 42 mg/dL, lactate dehydrogenase of 368 U/L, amylase of 107 U/L, with normal liver tests, lipase level and arterial blood gases.

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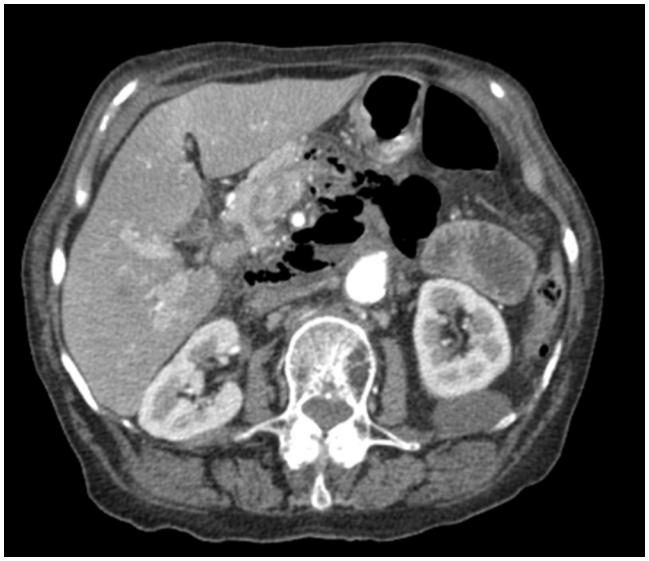

Fig. 1. CT scan evidencing a retroperitoneal perforation with retroperitoneal free air.

Abdominal X-ray showed no intra-peritoneal free air and computer tomography of the abdomen showed moderated extra-luminal retroperitoneal gas (Fig. 1).

An emergent laparotomy was performed. After mobilization of the Treitz angle pus and biliary content was found and further mobilization of the duodenum showed a perforated diverticulum in the fourth portion of the duodenum (Fig. 2), accompanied by extensive retroperitoneal phlegmon. With these findings we carried out a partial duodenectomy of portions 3 and 4 with end-to-side hand-sewed single-layer duodenojejunostomy (Figs. 3 and 4). The post-operative course was uneventful and the patient was discharged 12 days after surgery.

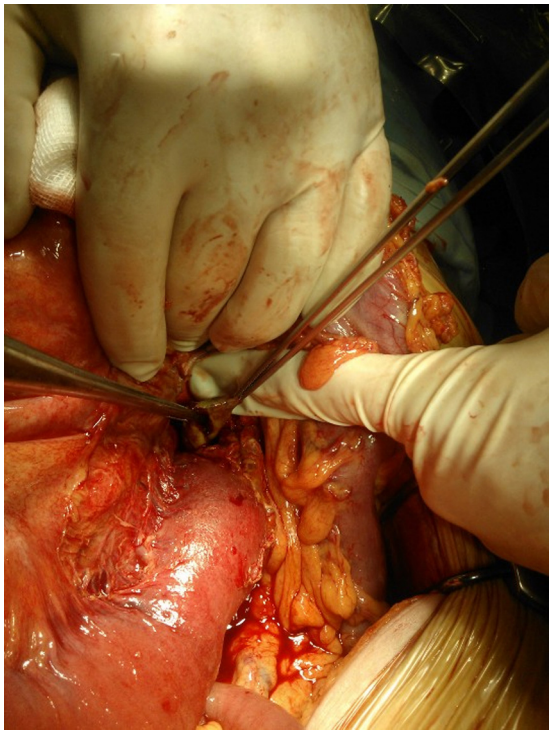

Fig. 2. Perforated diverticulum of the fourth part of the duodenum.

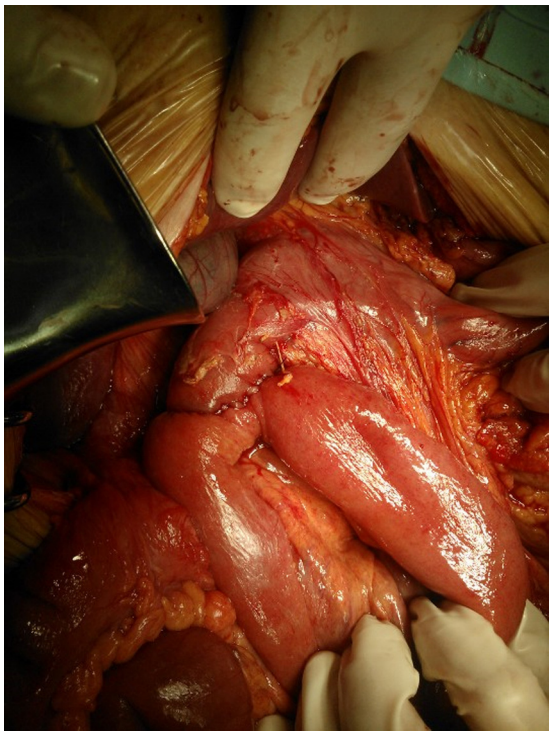

Fig. 3. Duodeno-jejunostomy.

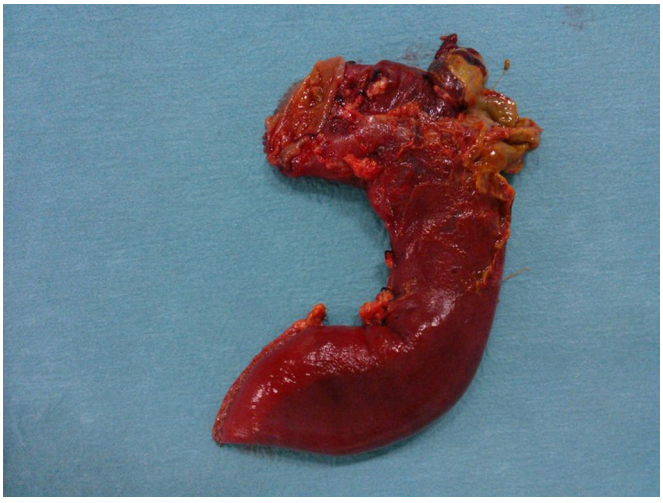

Fig. 4. Surgical specimen.

3. Discussion

DD can be congenital and acquired, with the latter being most common. Congenital diverticula contain all layers of the duodenal wall and acquired ones represent pulsion diverticula due to a protrusion of mucosa, *muscularis* mucosa and submucosa through a wall weakness, being the papillae one of those and explaining why the area within 2.5 cm of the ampulla of Vater is the predilection site for such pathology.[1,7,8]

Haemorrhage, inflammation, compression of surrounding organs, neoplastic progression,[9] cholestasis and perforation are rare complications of DD, being the last one the least frequent, only reported in 162 cases,[5] but also the most serious one.[2] Causes of perforation are multiple and include diverticulitis, enterolithiasis,