



GLOBAL JOURNAL OF MEDICAL RESEARCH
RADIOLOGY, DIAGNOSTIC, IMAGING AND INSTRUMENTATION
Volume 13 Issue 3 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN : 0975-5888

Perforated Duodenal Diverticulum: Diagnosis and Management

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GJMR-D Classification : NLMC Code: WS 141



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Perforated Duodenal Diverticulum: Diagnosis and Management

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I. CASE REPORT

A 50-year-old man presented to our centre with a 1-day history of sudden-onset epigastric and right upper quadrant pain, associated with nausea and vomiting. There was no fever or any other infective symptoms. His past medical history was significant for Type 2 diabetes, hypertension and hypercholesterolaemia. On examination, he was normotensive, tachycardic and apyrexial. Localised epigastric tenderness with associated voluntary guarding was appreciated. Rectal examination did not reveal any presence of blood or melaena. Laboratory data showed a haemoglobin of 162 g/L and white cell count of $17.1 \times 10^9/L$. CT abdomen with contrast demonstrated a thickened duodenal wall with a 2-centimetre diverticulum in the region of the duodenal papilla (Figure 1). This was associated with peri-duodenal fat stranding and extraluminal air posterior and lateral to the duodenal wall (Figure 1 & 2). After initial fluid resuscitation, a nasogastric tube was inserted and he was commenced on broad-spectrum antibiotics. Total parental nutrition was initiated and a repeat CT few days later demonstrated significantly smaller para-duodenal collection. He was slowly progressed to soft diet and was discharged 12 days after initial presentation with a plan for gastroscopy in 6 weeks.

II. DISCUSSION

Duodenum is the second most common location to be affected by diverticula, after the colon.^{2,3,5} They are typically pseudo-aneurysm, as not all layers of the bowel wall are affected.^{4,5,6} About 75% of them are located in the second part of the duodenum, usually within 2.5cm of the ampulla of Vater. Most of them (88%)

are located along the pancreatic or mesenteric border. The incidence of duodenal diverticula has been reported between 1-5% in upper GI studies and up to 22% at autopsies.¹ Duodenal diverticula are mostly asymptomatic, however complications such as bleeding, inflammation and perforation can develop in 5% of patients.⁵ Perforation represents the rarest but most serious complication, with mortality of up to 13%.¹

Perforated duodenal diverticulum poses a diagnostic challenge as there is no pathognomonic clinical features. Of all the 101 cases reported in literature, only 13 of the cases achieved accurate pre-operative diagnosis.¹ The symptoms are mostly non-specific and could mimic conditions such as peptic ulcer disease, acute cholecystitis and pancreatitis.⁷ Majority of the patients presented with acute-onset epigastric or right upper quadrant pain associated with nausea and vomiting,^{3,4,5} while some experienced chronic abdominal pain with anorexia and malaise.³ The diagnosis is by exclusion and requires clinician to possess a high index of suspicion.

Contrast-enhanced CT is a valuable diagnostic modality due to its ability to detect small amount of extraluminal air and delineate the retroperitoneal anatomy.³ It can even demonstrate the presence of a diverticulum in some cases. Typical radiographic findings include thickened bowel wall, fat stranding and extraluminal air or fluid.^{4,5} However, these are not diagnostic as perforated viscus close to an asymptomatic duodenal diverticulum can give a similar appearance.^{2,7} Post-bulbar duodenal ulcer for instance, can produce the clinical and radiological presentation of a perforated duodenal diverticulum.² Upper gastrointestinal series may be employed as part of the investigation but previous literature fail to prove its effectiveness.^{2,3} This could be explained by cases of diverticulum with tight neck or the presence of a calculus.³ Forward-viewing endoscopy can be useful in excluding pathologies such as peptic ulcer, but it has been shown to have a low-predictive value of diagnosing duodenal diverticulum.⁵ Side-viewing duodenoscopy may be the tool of choice,⁵ with Leinoven et al and Jin et al finding duodenal diverticulum in 7.1% and 24.6% of all patients who underwent ERCP, respectively.^{8,9} One rationale behind this is that forward-

viewing endoscopy may not reliably assess the concavity of the descending duodenum close to the ampulla of Vater, where most of the diverticulum lies.⁵

In cases of perforated duodenal diverticulum, the treatment of choice seems to be transduodenal diverticulectomy with two-layer closure.¹ Bypass procedure such as gastrojejunostomy and tube duodenostomy may be required.² Due to the close proximity of distal common bile duct and the ampulla of Vater, the surgeon must proceed with utmost care to avoid iatrogenic injury.¹ Complications associated with repair of perforated diverticulum include duodenal fistula, intra-abdominal abscess, sepsis and pancreatitis, with duodenal fistula being the commonest (20%).¹ In addition, laparoscopic¹⁰ and endoscopic¹¹ treatment of perforation have also been described. Conservative management of perforation is a feasible option provided

that the patient has mild symptoms and has radiographic evidence of a contained leak.⁶ Treatment involves nasogastric decompression, broad-spectrum antibiotics with or without percutaneous drainage of subsequent abscess formation.⁴ There have been reports in literature of successful outcome with such treatment.^{1,4,6} However, should there be clinical deterioration, surgical intervention is obviously warranted.

In conclusion, perforation represents the rarest complication of duodenal diverticulum and early diagnosis is challenging. Optimal treatment of this condition has not been well-established and may be guided by the patient's clinical condition. We present a case of a perforated duodenal diverticulum diagnosed by contrast-enhanced CT and managed successfully with a conservative approach.



Figure 1 : A 2-centimetre diverticulum can be appreciated in the regional of duodenal papilla

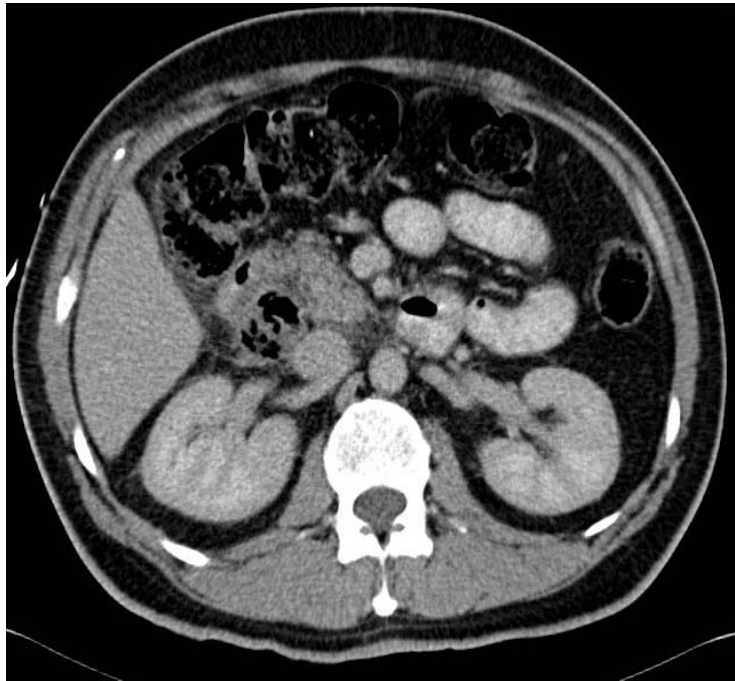


Figure 2 : Axial view showing extraluminal gas and induration of abdominal fat around the duodenum

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