

Peptic Perforation of the 4th Duodenal Segment: Case Report

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Abstract

Introduction: Even if the prevalence of peptic ulcer disease has decreased in the last years, duodenal perforation remains a life threatening complication. The duodenum is the second most common site of gastrointestinal perforations after the colon and perforation of the 4th portion is very rare.

Case presentation: A 67-years-old man was admitted to the emergency department of the Annecy Hospital with intense abdominal pain, vomiting and no transit for the last 24 hours. The laboratory count showed an inflammatory syndrome. A CT scan revealed free air and fluid near the Treitz's angle. An exploratory laparotomy was performed that revealed a perforation of the forth portion of the duodenum. A duodenal resection with duodeno-jejunal anastomosis was performed.

Discussions: Peptic ulcer disease is a common disease and the perforation is one of its most life threatening complications. The localization of the DP on the forth segment of the duodenum is very unusual. The most frequent localization of DP is the first duodenal segment. Abdominal CT scan is the most sensitive radiological exam if there is suspicion of a DP. A Zollinger-Ellison syndrome must be taken into count. Peritonitis is an indication for immediate laparoscopy or laparotomy, taking into account the patient's condition. Despite the successful medication therapy and the progress in treatment of duodenal ulcer, perforation remains a serious complication, requiring an emergency surgical treatment.

Conclusion: Duodenal perforation of the fourth portion is an extremely rare complication of the peptic ulcer disease and the surgery is the primary modality of treatment.

Keywords: Peptic ulcer; Perforation; Duodenum; Duodenal resection

Introduction

The incidence and prevalence of uncomplicated peptic ulcer disease (PUD) have decreased in the last years, especially because of the efficacy of treatment to eradicate Helicobacter pylori (HP) resulting a decreasing number of duodenal perforations (DP).

If an imbalance between the aggressive and protective factors occurs of the gastric mucosa, then the PUD may occur and eventually its complications. Most ulcers are associated with an infection by Helicobacter pylori (HP), AINS or stress [1]. Normally mucosal erosions should be equal to or exceed 0.5 cm deep and 3 mm wide to produce a duodenal perforation.

The duodenum is the second most common site for a digestive tract perforation after the colon. Duodenal ulcer perforations are 2 to 3 times more common than gastric ulcer perforations. Four million people worldwide are affected annually by PUD. About 10 to 20% of these patients will encounter complications, and 2% of the ulcers will perforate. The annual incidence of perforated ulcers ranges from 3.77 to 14 cases per 100,000 individuals. The peak of age is between 40 to 60 years [1-3].

The perforation is often the first clinical sign of PUD. The perforation site usually involves the anterior wall of the duodenal bulb (60%), although it might occur in the gastric antrum (20%) or in the gastric lesser curvature (20%) [2,4].

The geographic variations of the risk factors of PUD contributed to a decreased prevalence of the disease in West. The highest mortality of the disease occurs in Japan and Portugal, the lowest one in Canada and United States. Mortality for duodenal ulcer complications is high in Scotland, England, Italy and low in Belgium and France and also in the Third World countries [1].

Case Presentation

A 67-year-old male was admitted to the emergency department of the Annecy Hospital, France, with intense abdominal pain, vomiting and no transit for the last 24 hours. His past medical history was no significant.

On arrival his vital signs showed auricular temperature of 36.5°C, heart rate of 108 bpm and blood pressure of 106/66 mmHg. The physical exam revealed generalized abdominal voluntary guarding and rebound tenderness. Rectal examination did not reveal the presence of blood or melena, but the patient referred episodes of diarrhea with blood during the last 48 hours.

Laboratory data showed leukocytosis (12,200/mm³) with neutrophils at 9,750/mm³.

The CT-scan showed free air localized in front of the fourth duodenal segment, near the Treitz angle suggesting a duodenal perforation. A small quantity of liquid was found between the left colon and the abdominal wall (Figure 1).

An emergency laparotomy was performed and revealed a

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Figure 1: CT scan - free air localized in front of the fourth duodenal segment, near the Treitz angle suggestive for a duodenal perforation.

perforation of the fourth segment of the duodenum, 2 cm proximal to the Treitz angle associated to a localized peritonitis and multiple inflammatory false membranes. The Treitz angle was mobilized and a segmental resection of about 5 cm of duodenum with end to end duodeno-jejunal anastomosis was performed. An extensive peritoneal lavage was also completed. No drain was left in place. A broad-spectrum antibiotic therapy was initiated.

The patient's postoperative course was uneventful. The patient resumed oral intake on the 4-th postoperative day and was slowly progressed to soft diet. He was discharged from the hospital on the 13th post-operative day. The pathological exam confirmed the peptic duodenal perforation.

Discussion

The physical examination may find the patient in intense pain. The abdominal exam may found board-like rigidity of the abdominal wall if patient arrives in the phase of chemical peritonitis (0-6 hours). Hypotension, tachycardia or high fever are signs of gravity.

In the natural evolution if the patient awaits, the pain may improve because of the dilution of the duodenal contents by the peritoneal exudate but later the signs and symptoms of bacterial peritonitis reoccurs [12,13].

The localization of the DP on the forth segment of the duodenum is very unusual. The most frequent localization of DP is the first duodenal segment. Perforation of the second duodenal portion is very unusual too [14].

CT scan was useful to evoke the diagnosis and precise the site of the perforation in our case.

Abdominal CT scan is the most sensitive radiological exam if there is suspicion of a DP. Usually the findings consist of a thickened bowel wall, mesenteric fat stranding, and an extra luminal collection of air or fluid, retroperitoneal or in the peritoneal cavity [15].

Peritonitis is an indication for immediate laparoscopy or laparotomy, taking into account the patient's condition. An operation should be not be delayed by additional imaging if the patient's in poor clinical condition [16].

We took into count the possibility of Zollinger-Ellison syndrome (ZES). ZES or gastrinoma is a neuroendocrine tumor of the pancreas or duodenum characterized by the triad comprising usually striking gastric acid hyper-secretion, severe ulcer disease and non-beta islet cell tumors of the pancreas [23,24]. The increased secretion on the gastrin can result in a more severe or complicated peptic ulcer disease than for the patients with idiopathic ulceration. The annual incidence is estimated at 0.5 per million [21,22] and the majority of patients are

diagnosed between 20 and 50 years of age [25-27]. In our case the levels of gastrin and chromogranin A were normal. No Octreoscan was made.

Laparoscopic repair of DP is the golden-standard treatment. There is still meta-analysis who not support favorable outcomes for minimally invasive treatment of PPU and sustain the open surgery [17].

In this case laparotomy allowed the resection with anastomosis and peritoneal lavage and provided good short-term results, but for a "standard" perforation a laparoscopic approach is recommended.

Our therapeutic strategy for a DP of the fourth portion was the mobilization of the Treitz's angle, segmental duodenal resection with a primary duodenum-jejunum anastomosis. No drain was left in place, but this attitude may vary depending on the severity of the peritonitis. A simple suture is recommended with very good results and a low morbidity in perforations of the duodenal bulb, but in this case the surgeon preferred a segmental resection because of the unusual localization of the perforation and the personal preference of the surgeon for the open approach [1].

If the patient's condition doesn't allow a surgical operation or the perforation is delimited by the surrounding organs with mild abdominal symptoms and no evidence of impending sepsis, A non-operative, conservative approach may be considered if the patient condition allows that or he have anesthetic contraindication for the operation. This includes PPI and antibiotic treatment, resuscitation [1] with i.v. fluids, a nasogastric tube and percutaneous drainage of the collections if are present and symptomatic treatment. Also the HP eradication after surgery is required and HAS demonstrated to reduce the ulcer recurrence rate and the risk of hemorrhage [16].

Despite the successful medication therapy and the progress in treatment of duodenal ulcer, perforation remains a serious complication, requiring an emergency surgical treatment [18-20].

Conclusion

Perforation of the 4th duodenal segment is a rare complication of the peptic ulcer disease. The diagnosis is challenging because there are no patognomonical clinical signs the correct pre-operative diagnosis is based on a contrast-enhanced CT scan.

Emergency surgical intervention is recommended. Non-operative management should be reserved for selected patients.

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Conflict of interests

Authors have no conflict of interest to disclose.

References

1. Lau JY, Sung J, Hill C, Henderson C, Howden CW, et al. (2011) Systematic Review of the Epidemiology of Complicated Peptic Ulcer Disease: Incidence, Recurrence, Risk Factors and Mortality. *Digestion* 84: 102–113.
2. Suthar PP, Pandey G, Patel J, Doshi R (2014) Duodenal perforation: role of multi detector computed tomography (MDCT). *Int J Res Med Sci* 2: 1207-1211.
3. Lo HC, Wu SC, Huang HC, Yeh CC, Huang JC, et al. (2011) Laparoscopic Simple Closure Alone is Adequate for Low Risk Patients with Perforated Peptic Ulcer. *World J Surg* 35: 1873–1878.
4. Shamsuddeen U, Yusha'u M, Adamu IA (2009) *Helicobacter pylori*: the causative agent of peptic ulcer. *Bayero J Pure Appl Sci* 2: 79-83.
5. Yaw LOO, Asiri Arachchi Z (2014) Perforated Duodenal Diverticulum: Diagnosis and Management. *Glob J Med Res* 13.
6. Ming TY, Feng HK, Cherng YJ, Chuan CD, Pai LT, et al. (2012) Desafío clínico: diverticulitis con perforación de la segunda y tercera porción del duodeno. *Rev Esp Enfermedades Dig* 104: 156-157.
7. Basak F, Kinaci E, Aksoy S, Aren A (2006) Duodenal ulcer perforation and pneumothorax: a case report. *Acta Chir Belg* 106: 344-345.
8. Wu L, Yen H-H (2012) Sonographic diagnosis of peptic ulcer perforation. *QJM*. 105: 1217–1218.
9. Costa Simões V, Santos B, Magalhães S, Faria G, Sousa Silva D (2014) Perforated duodenal diverticulum: Surgical treatment and literature review. *Int J Surg Case Rep* 5: 547-550.
10. Chao HH (2008) Perforation of the duodenum by an ingested toothbrush. *World J Gastroenterol* 14: 4410-4412.
11. Costa Simões V, Santos B, Magalhães S, Faria G, Sousa Silva D, et al. (2014) Perforated duodenal diverticulum: Surgical treatment and literature review. *Int J Surg Case Rep* 5: 547-550.
12. Rossetti A, Christian BN, Pascal B, Stephane D, Philippe M (2013) Perforated duodenal diverticulum, a rare complication of a common pathology: A seven-patient case series. *World J Gastrointest Surg* 5: 47-50.
13. Bertleff MJ, Lange JF (2010) Perforated peptic ulcer disease: a review of history and treatment. *Dig Surg* 27: 161-169.
14. Siddique RAH. Prevalence of peptic ulcer disease among the patients with abdominal pain attending the Department of Medicine in Dhaka Medical College Hospital, Bangladesh.; IOSR Journal of Dental and Medical Sciences 13: 15-20.
15. Schnueriger B, Vorburger SA, Banz VM, Schoepfer AM, Candinas D (2008) Diagnosis and management of the symptomatic duodenal diverticulum: a case series and a short review of the literature. *J Gastrointest Surg* 12: 1571-1576.
16. Søreide K, Thorsen K, Søreide JA (2014) Strategies to improve the outcome of emergency surgery for perforated peptic ulcer: Emergency surgery for perforated peptic ulcer. *Br J Surg* 101: e51-e64.
17. Antoniou SA, Antoniou GA, Koch OO, Pointner R, Granderath FA (2013) Meta-analysis of laparoscopic versus open repair of perforated peptic ulcer. *JSLS* 17: 15-22.
18. Varcus F, Lazar F, Beuran M, Lica I, Turculet C, Nicolau EA, et al. (2013) Laparoscopic treatment of perforated duodenal ulcer - a multicentric study. *Chirurgia (Bucur)* 108: 172-176.
19. Đordjević I, Zlatić A, Janković I (2011) Treatment of perforative peptic ulcer. *Acta Fac Medicae Naissensis* 28: 95-107.
20. Chang HW, Choi WM (2007) Non-operative treatment of perforated duodenal ulcer: a case report and review of the literature. *J Emerg Crit Care Med* 18: 167-172.
21. Metz DC (2012) Diagnosis of the Zollinger–Ellison Syndrome. *Clinical Gastroenterology and Hepatology* 10: 126-130.
22. Osefo N, Ito T, Jensen RT (2009) Gastric acid hypersecretory states: recent insights and advances. *Current Gastroenterology Report* 11: 433–441.
23. McGuigan JE, Harty RF, Maico DG (1981) The role of gastrin in duodenal ulcer. *Trans Am Clin Climatol Assoc* 92: 199-207.
24. Epelboym I, Mazeh H (2014) Zollinger-ellison syndrome: classical considerations and current controversies. *The oncologist* 19: 44-50.
25. Alventosa-Mateu C, Ferrer-Barceló L, Huguet-Malavés JM, Ferrer-Arranz L, Monzó-Gallego A, et al. Síndrome de Zollinger-Ellison. *Revista Española de Enfermedades Digestivas* 105: 640-642.
26. Sonnenberg A, Sengupta A, Bauerfeind P (1988) Epidemiology of peptic ulcer disease. In: MRCP WDWRM, editor. *Advances in Peptic Ulcer Pathogenesis* [Internet]. Springer Netherlands; 1988: 1-31.
27. Lam SK (2000) Differences in peptic ulcer between East and West. *Baillie Á re's Clinical Gastroenterology* 14: 41-52.