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CASE REPORTS

Closure of Posterior Perforated Duodenal Ulcer using Endoscopic Assist: A Case Report

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ABSTRACT

Introduction: Posterior perforated duodenal ulcer penetrating the hepatoduodenal ligament is an exceedingly rare and technically demanding surgical emergency, often rendering standard perforation closure impossible because of the proximity of the portal vein, proper hepatic artery, and common bile duct.

Case Presentation: We report an 86-year-old man who presented with diffuse bile peritonitis secondary to posterior duodenal perforation penetrating the hepatoduodenal ligament. Conventional intraoperative exposure failed to identify the perforation site. On-table gastroscopy was performed and successfully localized the defect, guiding primary suture closure. Pyloric exclusion with gastrojejunostomy and feeding jejunostomy was performed for diversion and decompression. The postoperative course was complicated by gastrointestinal bleeding requiring angioembolization, wound evisceration, and hemorrhagic stroke. To the best of our knowledge, this is the first case in the English medical literature describing on-table gastroscopy to localize and guide closure of this type of perforation.

Conclusion: Intraoperative endoscopy represents a valuable localization tool in posterior duodenal perforation when conventional surgical exposure is inadequate. Primary closure guided by endoscopic tools may be safely considered in highly selected patients.

Keywords: perforated duodenal ulcer, intraoperative endoscopy, pyloric exclusion, damage control surgery

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INTRODUCTION

Perforated peptic ulcer disease (PPUD) remains a major surgical emergency associated with a high morbidity and mortality rate (1). Due to the very liberal use of abdominal CT and its high accuracy in PPUD, the preoperative diagnosis is relatively easy (2).

Most cases of PPUD occur in the anterior duodenal wall, and surgical treatment for such perforations consists of omental patch repair (Graham patch) or simple primary closure, with or without omental reinforcement, performed via either a laparoscopic or an open approach. When the laparoscopic approach is preferred in hemodynamically stable patients, it offers lower mortality and morbidity and shorter hospital stays than open surgery (3,4).

In contrast, the management of posterior duodenal perforation still remains a substantial surgical challenge. Due to their intimate proximity to critical structures such as the portal veins, the proper hepatic artery, and the common bile duct, simple duodenal closure is often unsafe and sometimes technically impossible. In this scenario, more complex and challenging procedures may be required.

The perforation of an ulcer into the hepatoduodenal ligament is exceedingly rare, and published experience is very limited. When the perforation defect cannot be clearly identified because of severe local inflammation, management becomes highly complex and does not fully align with most existing recommendations.

Here, we present the case of a critically ill patient with a large perforated duodenal ulcer penetrating the hepatoduodenal ligament. Despite large bile peritonitis, the exact perforation site could not be identified. The perforation was successfully closed using on-table gastroscopy and intraoperative endoscopic localization. The challenges, therapeutic options, and our dilemmas are discussed. Our case demonstrates that this approach may be safely performed in highly selected patients.

Case description:

An 86-year-old man was admitted to our emergency department with a one-day history of diffuse abdominal pain and vomiting. There was no fever and no other symptoms. His previous medical history included non-ischemic hypertrophic obstructive cardiomyopathy (HOCM), type 2 diabetes mellitus, hypertension, and chronic atrial fibrillation, treated by rivaroxaban.

During clinical examination, the patient appeared in significant respiratory distress. He was alert and oriented. Initial blood pressure was 130/80 mmHg, and heart rate was 130 beats per minute. Abdominal examination revealed diffuse rigidity and tenderness consistent with diffuse peritonitis. Laboratory investigations demonstrated a white blood cell count of 14.7×10^9/L, creatinine of 1.5 mg/dL, and lactate of 4.6 mmol/L. Other tests were unremarkable, including liver function tests. Electrocardiography confirmed rapid atrial fibrillation without acute ischemic changes. Given his clinical picture, an immediate abdominal CT scan was performed, which showed a significant amount of free intraperitoneal air and fluid (Pict 1).

Picture 1. Multidetector abdominal CT scan shows free intraperitoneal fluid (arrow white 1), free intra-abdominal air (white arrow 2), and retroperitoneal air near the second and third portions of the duodenum (white arrow 3).

Also, the thickening of the second and third part of duodenum was detected (Pict. 2). The radiologic findings were interpreted as highly suspected for the posterior wall duodenal perforation and the patient was immediately taken to the operating theatre.

Upon midline laparotomy, a large volume of infected bile and fibrin was observed in all abdominal compartments. Initial exploration of the abdominal cavity did not reveal the site of perforation. A dense, rigid fibrotic post-pyloric mass penetrating the hepatoduodenal ligament with severe local inflammation was palpated with. The anterior gastric and duodenal walls were edematous but intact. The lesser sac was entered via the gastrocolic ligament; the posterior gastric wall appeared normal. The full Kocher maneuver was performed; the anterior and medial walls of the second and third parts of duodenum appeared as intact. Systematic exploration of the small bowel from the Treitz ligament to the ileocecal valve, and entire large bowel was normal. Gastric insufflation with methylene blue dye demonstrated blue-stained bile fluid emerging from behind the hepato-duodenal ligament, confirming the presence of posterior perforation.

Attempts to fully mobilize the post-pyloric segment from the ligament were abandoned owing to extreme fibrosis.

Due to the inability to localize the perforation site by conventional operative exposure, the gastroenterology team was called to the operating room. On the table, gastroscopy was performed, and the saccular perforation

Picture 2. Multidetector CT scan demonstrates fat stranding around the second portion of the duodenum, raising suspicion for duodenal perforation.

of the posterior wall of the first part of the duodenum was identified.

Use of an endoscope optic assisted in achieving the critical view on both edges of the defect and served as a landmark for primary closure of the perforation with interrupted two-zero silk sutures. Pyloric exclusion was performed by stomach stapling approximately 2 cm proximal to the pylorus using a TA-90 linear stapler. A retrocolic isoperistaltic gastrojejunostomy was constructed with a loop of jejunum 50 cm from the ligament of Treitz, using an ENDO GIA stapler.

The surgery was completed with a Witzel feeding jejunostomy (16 Fr catheter) fashioned 30 cm down and forward from the anastomosis and brought out through the left abdominal wall.

Two Jackson–Pratt 10 Fr drains were left in the abdominal cavity: one in the Morrison pouch and the second in the right gutter space. The abdomen was primarily closed.

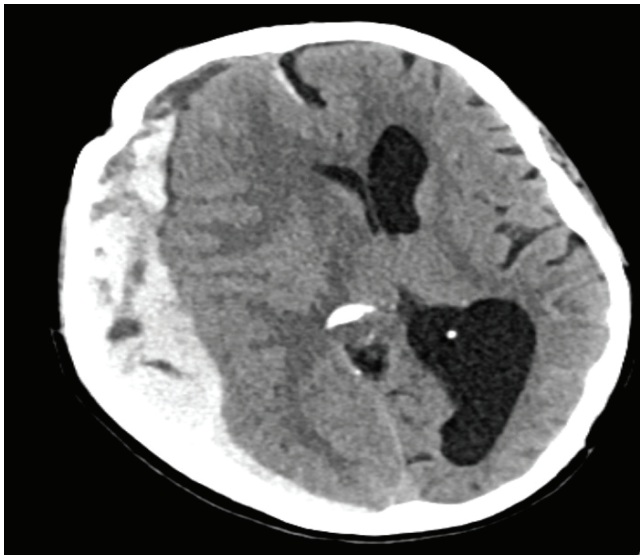
The patient was transferred to the intensive care unit when intubated and ventilated with no need for vasopressor support. On postoperative day 5, the patient developed upper gastrointestinal bleeding, manifesting as coffee-ground aspiration in the nasogastric tube and melena.

Immediate angiography was performed via right transfemoral approach with a 6 Fr sheath, and arterial blush sourced from the gastroduodenal artery was identified. The gastroduodenal artery and pancreaticoduodenal arcades were embolized using multiple coils (2.5–4 mm diameter), and complete occlusion was achieved.

On postoperative day 11, a repeat abdominal CT scan was performed due to two days of persistent fever and elevation of white blood cell count.

The CT demonstrated worsening of bilateral pleural effusions and a small volume of free intraperitoneal fluid without an organized collection. The findings were interpreted as compatible with postoperative changes.

On postoperative day 12, a significant amount of serosal discharge from the midline incision appeared, and the opening of the wound confirmed evisceration of the superior segment of the midline incision with prolapse of a small bowel loop.



Picture 3. The head CT scan demonstrates massive hemorrhagic stroke

On the same day, urgent re-laparotomy was performed. At surgery, no anastomotic leak, abscess, or intraperitoneal collection was identified. The abdominal wall was re-closed, and the patient was returned to the ICU in stable condition. The patient's condition had improved. Unfortunately, on postoperative day 20, due to his neurologic deterioration, the head CT scan showed a massive hemorrhagic stroke (Pict. 3).

During the multidisciplinary team discussion, it was decided that the patient is a candidate for supportive care management only. Since then, the tracheostomy was performed, and the patient was transferred to a chronic care institution after long hospitalization.

DISCUSSION

Perforated peptic duodenal ulcer disease is a true surgical emergency characterized by full-thickness breach of the duodenal wall, resulting in leakage of gastric and/or duodenal contents into the peritoneal cavity. It carries a mortality rate of approximately 9-30% and requires prompt diagnosis and treatment (5,6).

There is no doubt that resuscitation and physiological stabilization are critical initial preoperative steps, including large-volume crystalloid therapy, broad-spectrum antibiotics, nasogastric decompression, intravenous proton pump inhibitor therapy, and preparation for surgical intervention (2).

After achieving this primary goal, the patients undergo surgery. Anterior perforations are relatively easy to visualize and are amenable to primary suture repair and omental reinforcement. Currently, most stable patients are managed laparoscopically, which offers a relatively short learning curve and reduced overall morbidity, shorter hospital stays, and lower rates of surgical site infections (7,8,9).

In contrast, posterior perforation, and, when even worse, penetration into the hepatoduodenal ligament, converts such cases into a very challenging and devastating scenario. In these cases, chronic ulcers with associated intense fibrotic reaction obliterate tissue planes, making surgical anatomy very difficult even for very experienced surgeons in the field.

The hepatoduodenal ligament, containing the portal vein, proper hepatic artery, and common bile duct, critically limits the operative field. Moreover, in select cases, as in the described case, severe fibrosis and local inflammation render the Kocher maneuver ineffective and even dangerous due to the close proximity of the aforementioned vital structures.

Its exploration may be immediately life-threatening. In the present case, standard approaches were considered inappropriate, and our team discussed all alternative strategies during the surgery.

The simplest decision in our case was to avoid dangerous and potentially immediate life-threatening attempts to dissect this anatomic area in order to identify the exact perforation site and complete the surgery with massive irrigations and multiple drainage of the abdominal cavity alone.

Thus, to convert this perforation to a potentially controlled duodenal leak. In the presence of diffuse peritonitis, we thought that this option should be left as a last resort for bailout.

Another option was to perform resection with Roux-en-Y duodenojejunostomy.

We considered this option inappropriate in the presence of severe bile peritonitis and a very high risk of anastomotic disruption and conversion of a single perforation to multiple leak sites. The alternative was to perform pyloric exclusion with a gastrojejunostomy and a concomitant feeding jejunostomy.

This technique was adapted from its original application in severe duodenal trauma. By stapling across the stomach proximally to the pylorus and constructing a gastrojejunostomy, the technique diverts intraluminal content away from the duodenum, reduces pressure at the repair site, and allows healing in a decompressed environment. This option is a viable, reliable damage-control reconstruction for duodenal perforation (10,11).

One of the classic options also applied from the trauma damage control principles was to use the triple tube technique:gastrostomy, retrograde duodenostomy, and feeding jejunostomy (12,13).

However, all mentioned surgical options are reasonable when the closure of the defect is doable, even if the repair is not ideal/ incomplete and/or leaves the risk of recurrent bile leak and ongoing contamination.

In our case, it was very risky because even the placement of any type of tube into the duodenum requires clear identification of the perforation site, which was impossible at this stage. Following these very bad conditions, we decided to perform on-table intraoperative gastroscopy.

The risks and benefits of this non-conventional decision were carefully weighed, particularly given that, to the best of our knowledge, the application of intraoperative endoscopy as a “localization tool” for posterior duodenal perforation has not been previously described in the literature.

We assume that the greatest hazard of on-table upper endoscopy is the risk of increased perforation size due to air insufflation and iatrogenic manipulations. To reduce this, we used low-pressure insufflation and manually guided the endoscope tip by the surgeon.

On the other hand, the endoscope tip, carefully protruding through the defect from the abdominal aspect, provided unambiguous confirmation of the edges and dimensions of the perforation. Moreover, in this case, this technique allowed clear visualization of both edges of the ulcer and guided directed repair, where blind suturing would have been technically impossible and potentially extremely hazardous.

This report has several limitations. The management approach was necessarily individualized to the operative findings and the patient’s physiological status; no controlled comparisons are possible from a single case. Long-term follow-up regarding the status of the pyloric exclusion, the need for reversal or further intervention, and the natural history of the duodenal disease was not yet available at the time of reporting.

CONCLUSIONS:

Our case demonstrates that Intraoperative upper endoscopy represents a valuable localization tool in posterior duodenal perforation when conventional surgical exposure is inadequate. Primary closure guided by endoscopic tools may be safely considered in highly selected patients. The future reports may validate our conclusions and help to define better indications for this method

Editorial Statements

Ethics Approval and Consent to Participate
This study involved the analysis of data from human participants. The research protocol was reviewed and approved by the Institutional Ethics Committee and was conducted in accordance with institutional regulations, the principles of the Declaration of Helsinki, and internationally accepted standards for biomedical research ethics.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author Contributions (CRediT): Conceptualization & Methodology: OI, BO; Data Curation, Investigation and Writing – Original Draft: NT: Formal Analysis: OI, BK: Writing – Review & Editing: BO, NT: Supervision: BK. All authors have read and approved the final version of the manuscript.

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The authors used a generative artificial intelligence tool solely for language editing and grammar improvement. All scientific content, data analysis, interpretation, and conclusions were independently developed, verified, and approved by the authors.

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REFERENCES:

1. Ahmed M, Mansoor T, Rab AZ, Rizvi SAA. Risk factors influencing postoperative outcome in patients with perforated peptic ulcer: a prospective cohort study. Eur J Trauma Emerg Surg. 2022;48(1):81-86.
2. Arshad SA, Murphy P, Gould JC. Management of Perforated Peptic Ulcer: A Review. JAMA Surg. 2025;160(4):450-454.
3. Chan KS, Ng STC, Tan CHB, Gerard G, Oo AM. A systematic review and meta-analysis comparing postoperative outcomes of laparoscopic versus open omental patch repair of perforated peptic ulcer. J Trauma Acute Care Surg. 2023;94(1):e1-e13
4. Sermonesi G, Tian BWCA, Vallicelli C, Abu-Zidan FM, Damaskos D, Kelly et al. Cesena guidelines: WSES consensus statement on laparoscopic-first approach to general surgery emergencies and abdominal trauma. World J Emerg Surg. 2023;18(1):57.
5. Almadi MA, Lu Y, Alali AA, Barkun AN. Peptic ulcer disease. Lancet. 2024;404(10447):68-81.
6. Søreide K, Thorsen K, Harrison EM, et al. Perforated peptic ulcer. Lancet. 2015;386(10000):1288-1298.
7. Sokhal BS, Mohamedahmed A, Zaman S, Wuheb AA, Abdalla HE, Husain N et al. Laparoscopic versus open repair for peptic ulcer perforation: a systematic review, meta-analysis and trial sequential analysis of randomised controlled trials. Time to conclude! Ann R Coll Surg Engl. 2025;107(5):331-345.
8. Coe PO, Lee MJ, Boyd-Carson H, Lockwood S, Saha A. Open Versus Laparoscopic Repair of Perforated Peptic Ulcer Disease: A Propensity-matched Study of the National Emergency Laparotomy Audit. Ann Surg. 2022;275(5):928-932.
9. Chan KS, Ng STC, Tan CHB, Gerard G, Oo AM. A systematic review and meta-analysis comparing postoperative outcomes of laparoscopic versus open omental patch repair of perforated peptic ulcer. J Trauma Acute Care Surg. 2023;94(1):e1-e13.
10. Vaughan GD 3rd, Frazier OH, Graham DY. The use of pyloric exclusion in the management of severe duodenal injuries. Am J Surg. 1977;134(6):785–790.
11. Tarasconi A, Coccolini F, Biffl WL, Tomasoni M, Ansaloni L, Picetti et al. Perforated and bleeding peptic ulcer: WSES guidelines. World J Emerg Surg. 2020 Jan 7;15:3.
12. Malhotra A, Biffl WL, Moore EE, et al. Western Trauma Association critical decisions in trauma: diagnosis and management of duodenal injuries. J Trauma Acute Care Surg. 2015;79(6):1096–1101.
13. Karveli E, Gogoulou I, Patsaouras PA, Papamichail M, Ioannides C. Triple Tube Drainage for the Treatment of Complex Duodenal Injury: A Case Report and Literature Update. Cureus. 2023;15(6):e39995