



ORIGINAL RESEARCH PAPER

General Surgery

A RARE CASE OF PERFORATION OF SECOND PART OF DUODENUM – A CASE REPORT

KEY WORDS: perforation, duodenum, retroperitoneum, gastrostomy, jejunostomy

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ABSTRACT

Perforation of the duodenum is a rare but potentially fatal injury. Duodenal perforations can be due to varied reasons, including peptic ulcer disease, iatrogenic causes, and trauma. Among these perforations of the second part of duodenum not pertaining to any of the above causes is a much rarer entity. Moreover a posterior wall perforation leading to retroperitoneal collection is a diagnostic dilemma. The most useful imaging approach for detecting duodenal perforation is computed tomography with intravenous and oral contrast. Surgical exploration may be required for diagnosis in some circumstances. The nature of the illness process that caused the perforation, the time, location, and extent of the injury, and the patient's clinical condition all influence the treatment. In stable patients with sealed perforations, conservative approach appears to be possible. Patients who present with peritonitis and/or intra-abdominal sepsis necessitate immediate surgery. In certain patients with duodenal perforations, minimally invasive treatments are a safe and effective alternative to open surgery. Here we present one such rare case of second part of duodenum perforation not attributable to any of the aforementioned causes and free fluid confined to the retroperitoneal space.

INTRODUCTION:

The duodenum is a portion of the gastrointestinal tract that is located between the stomach and the small intestine. It is divided into four sections:

1. The duodenal bulb is the proximal part, which attaches to the liver via the hepatoduodenal ligament, which contains the hepatic artery, portal vein, and common bile duct.
2. The pancreatic head is surrounded by the second or descending segment.
3. The horizontal section is the third segment. This segment is surrounded on all sides by superior mesenteric vessels.
4. The jejunum is followed by the fourth segment.

Perforation of the duodenum is a rare but fatal disorder [1]. The mortality rate has been reported to range from 8% to 25% in the literature [2] [3] [4]. Muralto described the perforated duodenal ulcer in 1688, and Lenepneau reported it [5]. In 1894, Dean published the first case of a perforated duodenal ulcer that was successfully closed surgically [6]. Cellan-Jones reported a technique for fixing perforations using an omental patch in 1929, and Graham improved on that approach in 1937 [7] [5]. Perforation of the duodenum can be either free or contained. When intestinal contents leak freely into the abdominal cavity, causing diffuse peritonitis, this is known as free perforation. When an ulcer produces a full-thickness hole, unfettered leaking is blocked by adjoining organs such as the pancreas that wall off the area [5]. The various causes attributing to the perforation of the duodenum are peptic ulcer disease, iatrogenic causes, and trauma. Patients with duodenal ulcers frequently experience nocturnal abdominal pain or hunger. Perforation can result in a rapid onset of significant pain in the upper abdomen if it occurs. Clinical signs can be undetectable in immunocompromised or elderly patients, delaying diagnosis. Iatrogenic injuries may be due to endoscopic injuries or surgical injuries. Traumatic isolated duodenal perforation is usually rare and is associated with other injuries. Thin sharp objects when

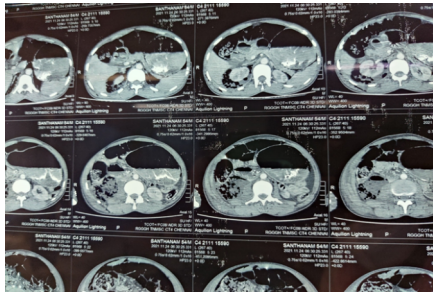
swallowed may cause perforation. Spontaneous perforation is sometimes rarely seen in neonates. In our case we present a case of perforation of second part of duodenum not attributable to any of the usual causes.

Case Report

A 54 year old male presented with the chief complaints of abdominal pain, vomiting and constipation for 3 days. On examination he had a diffuse swelling in the face and chest region. On further probing he had breathlessness before 3 days. He does not have any comorbidity. He is a known smoker and alcoholic for the past 30 years. There was no history suggestive of peptic ulcer disease, no history of trauma or any history suggestive of iatrogenic causes. On examination patient had a BP of 100/70mmhg, PR was 102/min, RR was 24/min, spO2 was 94% on RA. On abdominal examination there was tenderness in right and left lumbar region, right and left iliac and hypogastric region and umbilicus region. There was abdominal distension. Guarding and rigidity (+). There was presence of subcutaneous emphysema with crepitus in face and chest region.

Investigations

Blood investigations revealed an elevated leukocyte count of 14,100, Haemoglobin 7.4 g/dl, platelet count of 86,000, Elevated Urea- 236mg/dl, creatinine- 2.5mg/dl, Total Bilirubin: 5.0mg/dl, Direct Bilirubin: 2.0mg/dl, Elevated SGOT-139IU/L, SGPT-166IU/L, Albumin- 2.2 g/dl. Electrolytes were normal. Given the hemodynamic stability of the patient, the patient was shifted for CT scan. Oral and iv contrast enhanced CT scan of the abdomen revealed a possibility of D3 segment perforation of the duodenum with retro peritoneal air pockets with fluid collection noted in right perinephric region which is tracking along pro peritoneal space of anterior abdominal wall and along the right para-colic gutter to presacral space and pelvis. Contrast enhanced CT scan of the chest revealed right moderate pleural effusion, extensive pneumomediastinum with subcutaneous and intermuscular chest wall emphysema.



CT image shows retroperitoneal air pockets with fluid collection

Operative Procedure

Patient was taken up for emergency laparotomy and right intercostal drainage after adequate resuscitation with blood and blood products. Patient was transfused with 2 packets of PRBC, 4 packets of FFP and 4 packets of platelets. Intraoperative findings included retroperitoneal biliopurulent collection (around 50ml) was present. Perforation of size 1.5 x 1.5 cm noted in the posterior wall of D2. Thorough peritoneal lavage was done using warm saline. Retrograde tube duodenostomy done using 12 Fr suction catheter 10cm distal to DJ flexure. Tube duodenostomy using 16 Fr Foley’s catheter done via perforation site. Exclusion of antrum done using 60mm TA stapler. Antecolic, posterior gastrojejunostomy was done 30cm distal to retrograde tube duodenostomy. Jejunojenuostomy was done 20cm distal to gastrojejunostomy. Feeding jejunostomy done 20cm distal to jejunojenuostomy. Drain tubes were placed in oesophageal hiatus, Morrison’s pouch and pelvis. Complete haemostasis achieved. Abdomen was closed in layers after verifying pads and instrument count.



Fig shows Posterior wall of D2 perforation

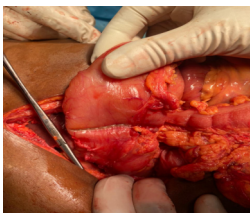


Figure shows Gastrojejunostomy

DISCUSSION

Due to the development of current medical therapy such as proton pump inhibitors and Helicobacter pylori eradication, the incidence of peptic ulcer perforation is decreasing. When duodenal ulcers do arise, they usually occur in the first part of the duodenum, with perforations in the second part of the duodenum being far less prevalent. A number of risk scoring systems have been developed to predict the prognosis of perforated peptic ulcers. Preoperative shock, significant medical co-morbidity, and delayed presentation, according to Boey et al, are the key prognostic factors determining postoperative mortality [8]. Because our patient had two of these risk variables (shock and delayed presentation), his mortality rate was projected to be between 38 and 45.5 percent [9].

Patients who are unsuited for definitive surgery at the time of presentation have long been treated with the concepts of damage control surgery [10]. In this case, however, the operation we performed eliminated the necessity for a

laparotomy. A partial gastrectomy with possible biliary reconstruction would have been the decisive operation in this patient. In view of emergency setting definitive procedure could not be done due to the contamination and unprepared duodenum.

A triple-ostomy is an old procedure that involves managing a duodenal perforation as a controlled duodenal fistula rather than risking a leak after primary repair. Since Billroth’s time, catheter duodenostomies have been used for a variety of applications. Many authors discuss how they can be used to manage the duodenal stump following a gastric resection [11] [12]. The gastrostomy was inserted in our case to prevent gastric contents from reaching the duodenum. This is less uncomfortable for the patient than a long-term nasogastric tube, and it also lowers the risk of aspiration and respiratory problems. A feeding jejunostomy was inserted to prevent the requirement for long-term parenteral nutrition and the hazards that come with it.

CONCLUSION

This case report highlights a rare case of perforation of the second part of the duodenum whose cause could not be ascertained to any of the enlisted causes of a second part duodenal perforation. The only probable unexplainable cause could be the peptic ulcer forming in the second part of duodenum causing perforation. We were also able to demonstrate the benefit of using a triple ostomy procedure, a damage control procedure where definitive surgery would not be appropriate in emergency setting.

Consent from patient: Obtained

Conflict of interest: None

Ethical committee approval: Not required

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Abbreviations:

- BP- Blood Pressure
- PR- Pulse Rate
- RR- Respiratory Rate
- RA- Room Air
- CT- Computed Tomography
- SGOT- Serum Glutamic Oxaloacetic Transaminase
- SGPT- Serum Glutamic Pyruvic Transaminase
- PRBC- Packed Red Blood Cells
- FFP- Fresh Frozen Plasma
- D2- Second part of duodenum

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