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Unusual perforation of the small bowel: A case report and literature review

Amin Tanveer, Josephine Chitty, Peter Evans

ABSTRACT

Spontaneous, non-traumatic perforation of the small bowel is an uncommon surgical emergency. Although, duodenojejunal flexure is a common site for traumatic bowel perforation due to its relative fixation by the ligament of treitz, Hereby, we present case of a 75-year-old man who presented with spontaneous perforation of duodenojejunal flexure secondary to a non-specific ulcer. The patient underwent emergency laparotomy and resection of the affected part of small bowel. Postoperatively, he made a good recovery and was discharged home. Early recognition and radical surgical resection of the affected small bowel ulcer site is considered the best treatment, and has a favourable outcome.

Keywords: Perforation of the small bowel, Non-specific ulcer of small bowel, Idiopathic chronic ulcerative enteritis

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INTRODUCTION

Spontaneous, non-traumatic perforation of the small bowel is an uncommon surgical emergency. The annual incidence is reportedly 1 case per 350,000 individuals in literature [1]. Ulcerations of the small intestine distal to the duodenum are rare, in some cases of small bowel ulceration, no specific cause can be found. These idiopathic ulcers are described as the syndromes of the isolated nonspecific ulcer and idiopathic chronic ulcerative enteritis (ICUE).

Duodenojejunal flexure is a common location for traumatic bowel perforation due to its relative fixation by the ligament of treitz, which makes it more susceptible to injury by shearing forces. The bowel and mesentery are injured in ~2.5% (range 0.3-5%) of blunt abdominal trauma [2]. Spontanous duodenojejunal flexure perforation due to a non specific ulcer has not been reported in the literatures.

CASE REPORT

A 75-year-old man presented with severe abdominal pain, nausea, and vomiting. His past medical history included gastroesophageal reflux, hypertension, coeliac disease and depression. His regular medications included Esomeprazole 40mg daily, Amlodipine 5 mg daily, Alprazolam 0.5 mg nocte, Mirtazapine 60 mg nocte, Quetipine 300 mg nocte, Doxepin 175 mg nocte and vitamin A capsule.

On examination, his vital signs were normal, however, he had generalized peritonism on abdominal palpation. His laboratory tests showed slightly elevated white cell count 13.6(10*9/L) with neutrophils being 11.4(10*9/L), otherwise his renal function tests and liver function tests were normal. He was resuscitated with intra venous fluid, and a broad spectrum antibiotic was given.

An abdominal CT scan was performed which revealed pneumoperitoneum and free fluid within the abdomen and pelvis (Figure 1, 2), likely due to a perforated duodenal ulcer, and the proximal small bowel was edematous consistent with enteritis.

The patient underwent emergency laparotomy. The intraoperative findings showed free purulent exudate and enteric fluid in the abdominal cavity, and diffuse inflammatory reaction of the peritoneum.

After inspection of stomach and duodenum which were normal, the small bowel was traced through its entire course, and a large perforation was found in antimesenteric border of the duodenojejunal flexure (Figure 3,4). The small bowel serosa was hyperemic and edematous but remaining of the small bowel was normal.

The fourth part of duodenum (D4) was mobilized. D4 including 15 centimeter of the proximal jejunum were resected using Endo GIA Staples 60mm and oversewed with prolene 3/0 continous suture. A single layer hand sewn side to side duodenojejunal anastomosis (to second part of duodenum) was performed after mobilization of the second part of duodenum (Figure 5). The abdomen was closed after thorough wash with 6 litres of normal saline and placement of two intra-abdominal drains.

The patient had a prolonged paralytic ileus, which was managed conservatively with total parenteral nutrition. He recovered well and was discharged home on day 12.

History of the patient was revisited and it revealed that he has had epigastric pain for a few weeks to months, which was worse in the last two weeks. His pain was associated with nausea, decreased oral intake and weight loss of approximately 10 kg. He was previously investigated by a private gastroenterologist with gastroscopy and colonoscopy, which were reported normal. He also had a magnetic resonance enterography which was reported as mild narrowing of the third/fourth part of the duoedenum, with no mural thickening.

We were unable to identify an obvious cause for his ulcer. Histology of the small bowel was also re-examined by an anatomical pathologist who reported focal areas of mucosal ulceration, and perforation being confirmed in one area characterized by full thickness necrosis of the small bowel wall with an associated acute florid serositis, with no evidence of vasculitis, thromboemboli, amyloid, viral inclusions, dysplasia or invasive malignancy, most likely being a non-specific ulcer (Figure 6).

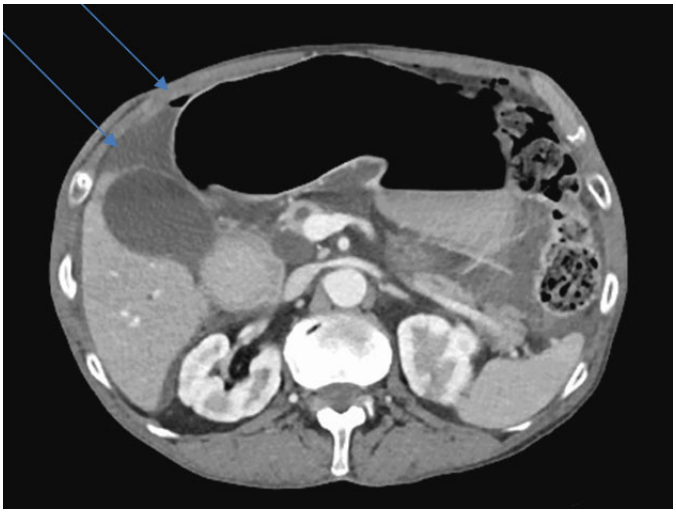

Figure 1: Coronal section of computed tomography scan shows intra abdominal free fluid and free air.

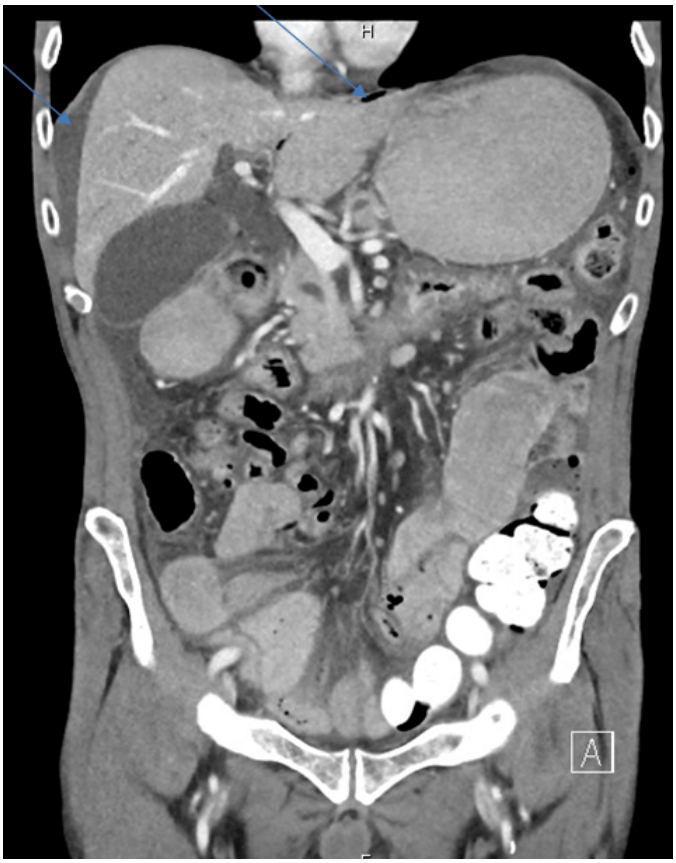

Figure 2: Sagital section of computed tomography scan shows intra abdominal free air and free fluid.

DISCUSSION

Spontaneous, non-traumatic perforation of the small bowel is an uncommon surgical emergency. The annual incidence is reportedly 1 case per 350,000 individuals [1].

Spontaneous perforation of the duodenojejunal flexure secondary to a non-specific small bowel ulcer hasn't been reported in the literatures.

It is a common location for traumatic bowel perforation due to its relative fixation by the ligament of treitz, which makes it more susceptible to injury by shearing forces. The bowel and mesentery are injured in ~2.5% (range 0.3-5%) of blunt abdominal trauma [2].

The causes of non-traumatic perforation include immune-mediated disease, infection, medication, congenital disorders, metabolic disturbances, vascular conditions, and neoplasia such as Gastro Intestinal stromal tumour, which can manifest as Gastro Intestinal hemorrhage, intestinal obstruction, or perforation [3].

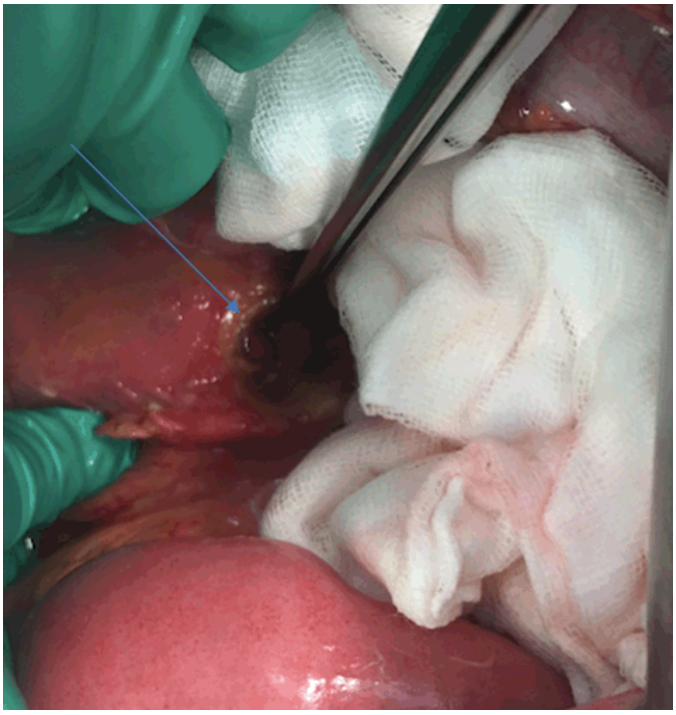

Figure 3: Shows perforation site at duodenojejunal flexure on anteriolateral surface.

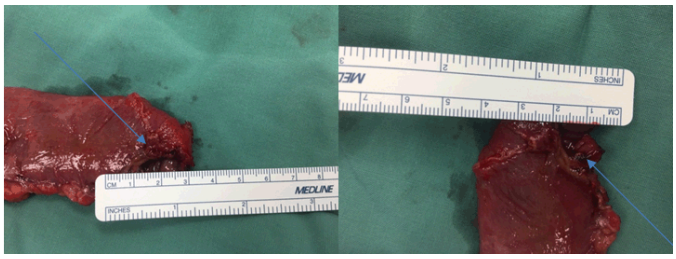

Figure 4: Length and width of perforated small bowel ulcer.

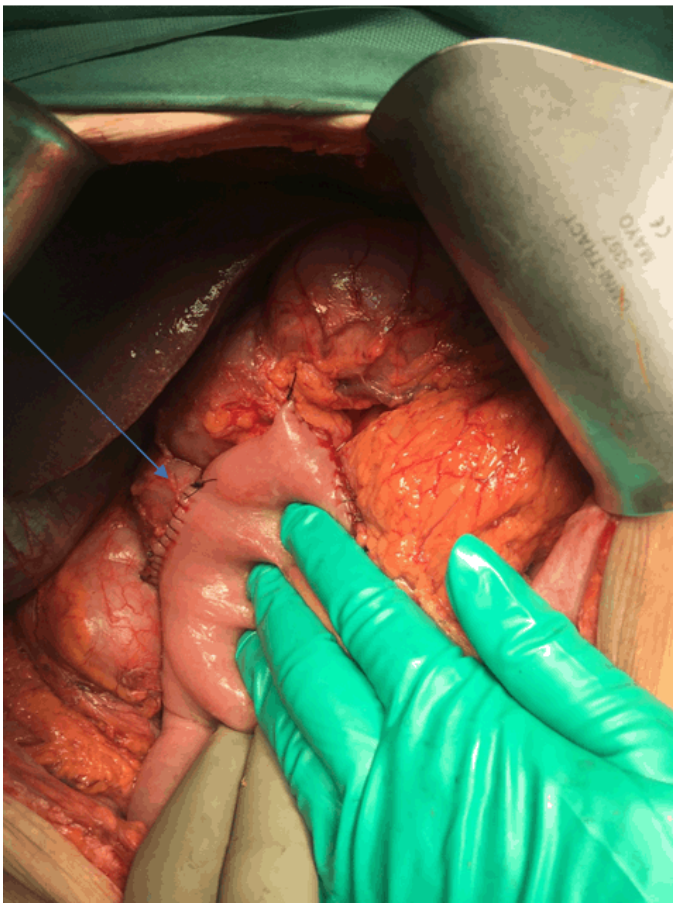

Figure 5: Shows duodenojejunal (second part of duodenum to proximal jejunum) anastomotic area.

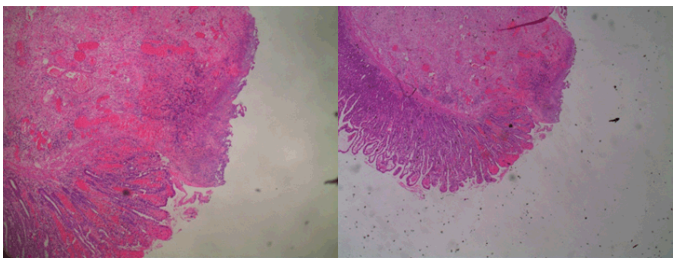

Figure 6: Shows histological imaging of perforation.

Ulcerations of the small intestine distal to the duodenum are rare. They have been described in conjunction with numerous diseases, including lymphoma, carcinoma, radiation enteritis, ischemia, Crohn's disease, systemic lupus erythematosus, Henoch-Schönlein purpura, Behçet's disease and numerous medications such as thiazides, potassium tablets, or nonsteroidal anti-inflammatory drugs [4].

In some cases of small bowel ulceration, no specific cause can be found. These idiopathic ulcers are described as syndromes of the isolated nonspecific ulcer and idiopathic chronic ulcerative enteritis (ICUE).

The previous literature has shown that it is difficult to diagnose nonspecific small bowel ulcers preoperatively because nearly all cases are identified during laparotomy or autopsy [5]. The mortality rate for nonspecific small bowel ulcers reported to be as high as 8.5% [6].

Concomitant diseases have been found in many patients with nonspecific intestinal ulcers, which includes angina, hypertension, rheumatic heart disease, intermittent claudication, leukemia, Wegener's granulomatosis, sarcoidosis, Felty's syndrome, myeloproliferative disease, and gallbladder disease [6].

Early presenting features may include colicky mid epigastric pain, nausea, vomiting, diarrhea, weight loss, abdominal bloating or distension, and nutritional deficiencies.

The diagnosis is usually made when a complication of the ulcer occurs, such as small intestinal obstruction, perforation, or bleeding. Intestinal obstruction (50%), bleeding (22%), and perforation (10%) are the common presenting features [6, 7].

Computed Tomography scan has been established as the most valuable imaging technique for identifying the

presence, site and cause of GI tract perforation.The most common radiologic findings are ileus, fat stranding, and pneumo peritoneum that occur as localized gas bubbles in the mesentery adjacent to the perforation [8].

Regardless of the cause, patients with intestinal perforation typically present with acute onset abdominal pain and usually associated with fever, nausea, and vomiting. Physical examination typically reveals diffuse peritonism on palpation. Laboratory test results are nonspecific and only help to guide preoperative resuscitation. For perforated peritonitis, regardless of the cause, laparotomy has been the gold standard treatment. Bowel resection and anastomosis, primary suture repair, or ostomy may be utilized depending on the intraoperative findings and cause of perforation.

In case of non-specific ulcer perforation radical surgical resection of the affected bowel is considered the best available treatment [9].

CONCLUSION

Spontaneous perforation of the duodenojejunal flexure secondary to a non-specific ulcer hasn't been reported in the literatures. Early recognition and radical surgical resection of the affected part of the small bowel is the best treatment and has a favourable outcome.

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Author Contributions
Amin Tanveer – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Josephine Chitty – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Peter Evans – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor of Submission
The corresponding author is the guarantor of submission.

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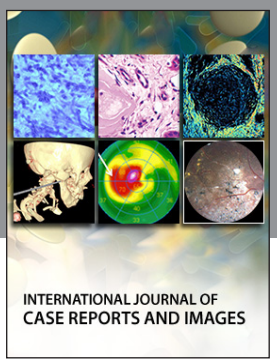
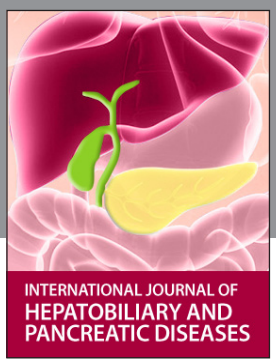
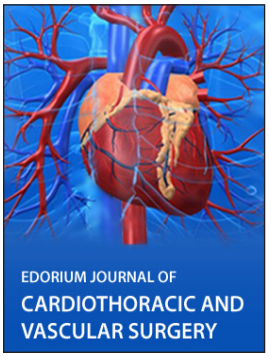
Consent Statement
Written informed consent was obtained from the patient for publication of this case report.

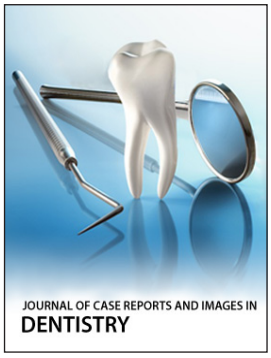
Conflict of Interest
Authors declare no conflict of interest.

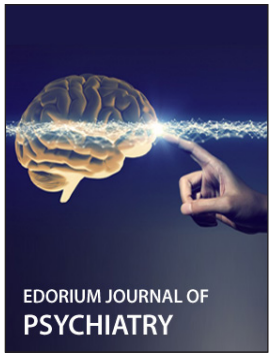
Data Availability
All relevant data are within the paper and its Supporting Information files.

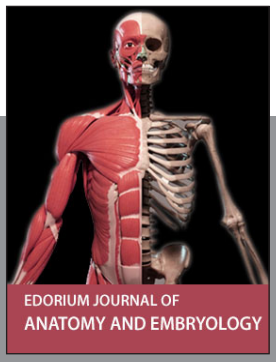


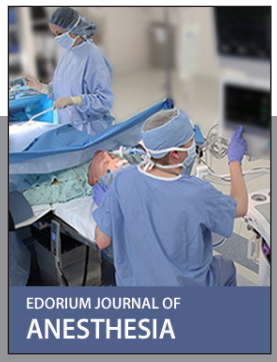












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