

A rare case of acute mesenteric ischaemia and duodenal ulcer perforation together in a single patient in a tertiary care hospital

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Abstract

A 57 years old male presented in the emergency department of EAST Surgical Ward, MAYO Hospital Lahore in February 2021 with complaints of abdominal distension, pain and vomiting. He was a chronic smoker and diagnosed hypertensive for the last 14 years but was non-compliant with oral antihypertensive medications. He was a factory worker and took NSAIDs off and on for pain in the knee joint for the last five years. On examination, his abdomen was tense and tender with resonant percussion notes in the right hypogastrium and epigastrium. His chest x-ray showed free gas under the right diaphragm. Diagnosis of a perforated duodenal ulcer was made and exploratory laparotomy was done. Examination revealed a perforated ulcer in the first part of the duodenum with greenish gangrenous patches on the next 3 feet of the small gut. Graham's patch repair and resection of the diseased small gut was done and a jejunostomy was performed. Unfortunately, the patient expired on 2nd postoperative day due to sudden cardiopulmonary arrest.

Keywords: Peritonitis, Mesenteric ischaemia, Perforation, Gastric ulcer, Duodenal ulcer, Case report.

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Introduction

Acute mesenteric ischaemia (AMI) is defined as a syndrome caused by inadequate blood flow through the mesenteric vessels, leading to gut ischaemia and finally gangrene of the bowel. AMI is usually divided into two broad groups, one caused by arterial occlusion and the other by venous occlusion. Venous AMI presents in the form of mesenteric venous thrombosis (MVT).¹ The Embolic phenomenon is the most common cause of AMI encountered in about 50% of the cases, followed by arterial thrombosis in 25% patients, NOMI in approximately 20% and MVT in less than 10% cases.² It should be noted that whether the cause of ischaemia is arterial or venous, there occurs haemorrhagic infarction in all cases, which eventually leads to perforation of the bowel. The frequency of mesenteric ischaemia is about

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6% to 29% and it increases with age. The investigation of choice is CT angiography of the abdomen. The most common clinical finding is pain disproportionate to the physical examination together with the presenting symptoms of nausea, vomiting, anorexia and diarrhoea.³

A peptic ulcer is a gross term which includes ulcers, both in the stomach and duodenum. The most frequent cause is infection with the bacteria *Helicobacter Pylori*. Regular use of pain killers, especially NSAIDs, and other factors like smoking, drinking alcohol, eating spicy foods, and having untreated stress.⁴ *Helicobacter Pylori* is more prevalent in developing countries like Pakistan, and duodenal ulcer perforations are found more frequently when compared to gastric ulcer perforations in the ratio 5: 1 in Pakistan and 32: 1 in India. Peptic ulcer perforations occur in only 5% to 10 % of active peptic ulcer disease.⁵

This case report shows the case of a male patient who presented in the emergency department with signs and symptoms of peritonitis. He was diagnosed as perforated peptic ulcer. But later, laparotomy revealed a perforated peptic ulcer and mesenteric ischaemia of the small intestine.

Case Report

A 57-year old male hypertensive patient, a chronic smoker, presented in the emergency department of EAST Surgical ward MAYO Hospital Lahore in February 2021 with chief complaints of abdominal distension and vomiting since the past three days and sudden onset of abdominal pain for one day. He was a factory worker by profession and had a smoking history of 1 pack per day for the past 25 years. Hypertension had been diagnosed, but he was non-compliant with the medication. He was also taking analgesics intermittently for one year for trauma to the knee joint in the factory while working. On presentation in the emergency department, his pulse rate was 142 per minute and regular, blood pressure of 145/90 mmHg, respiratory rate of 32 per minute, and temperature of 99-degree Fahrenheit. On abdominal examination, there was more generalized tenderness in the epigastrium, and bowel sounds were audible. Percussion notes were resonant in the right hypochondrium and epigastrium while dull in the rest of the abdomen. Digital rectal examination was

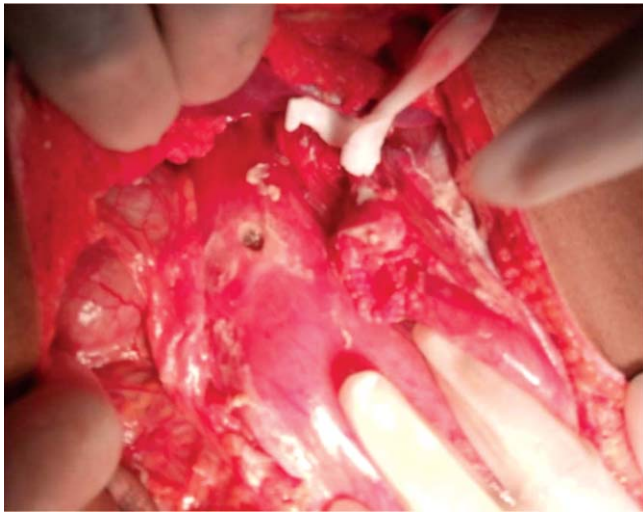


Figure-1: Duodenal ulcer perforation on first part of the duodenum.

unremarkable. Complete blood count showed an average haemoglobin level with a total leukocyte count of 22×10^9 . Electrocardiogram was done and found normal. His chest X-ray showed free gas under the right diaphragm, and an erect position abdominal X-ray showed a ground-glass appearance. Diagnosis of duodenal ulcer perforation was made because of positive risk factors present which included, age, smoking and history of NSAIDs use. It was planned to undertake exploratory laparotomy under general anaesthesia after written and informed consent from the patient. The surgery was undertaken approximately 3 hours after the presentation in the emergency department.

On exploration of the abdomen through an upper midline umbilical saving incision, there was a gush of air with approximately 2.5 liters of purulent fluid from the abdominal cavity. On inspection of the peritoneal cavity,



Figure-2: Small intestine showing multiple greenish gangrenous patches.

there was perforation of about 1x1 cm in the first part of the duodenum (Figure-1). On examination of the small intestines, there were multiple green coloured gangrenous ischaemic patches on about 3-foot length of the small intestine starting from about 3 feet distal to the duodenojejunal junction to about 1 foot proximal to the ileocolic junction (Figure-2). The perforation was repaired by using Graham's patch. The ischaemic portion of the small intestine was resected, and a double barrel jejunoleostomy was made. Surgery was uneventful, and the patient was extubated. The specimen of the small intestine was sent for histopathology.

Postoperatively, Echocardiography and Troponin-I were normal. The patient remained stable for two days after surgery, but unfortunately, on the 2nd postoperative day, he developed sudden dyspnoea and tachypnoea. Arterial blood gases showed compensated metabolic acidosis, and the patient was shifted on a ventilator and unfortunately expired on the 2nd postoperative day due to sudden cardiac arrest. Later the biopsy report of the small intestine showed ischaemia of the gut.

Discussion

There are very few cases reported in the literature on the perforation of a hollow viscus showing a dual pathology in a single patient. Perforation in two hollow viscera with an entirely different pathophysiology is a rare entity. This was seen in the presented case as duodenal ulcer perforation and mesenteric ischaemia.⁶ Duodenal ulcer perforation is caused by *H. Pylori* infection, NSAIDs, and smoking. In contrast, mesenteric ischaemia is caused by occlusion of the bowel blood vessels due to thrombus formation of embolus secondary to cardiac pathology. If such a dual pathology is encountered, the question arises which occurred first, or is one pathology the cause of the second pathology or are both simultaneous disease processes.⁷

After a thorough literature search, only two case reports were found in which simultaneous mesenteric ischaemia and duodenal ulcer perforations were reported. In a case report published by Emile SH et al. in 2018, a patient presented with acute abdomen and had dual pathology of duodenal ulcer perforation and mesenteric ischaemia. However, the histopathology showed mesenteric ischaemia due to polyarteritis nodosa.⁸

Another study done by Luther et al. in 2018 showed exactly the same dual pathology, in which patients presented with acute abdomen and had these dual perforations. The author of this study also encountered another case of dual perforations where duodenal ulcer perforation was found along with enteric perforation.⁹

In another case report published by Zhao et al in 2021, three cases of acute mesenteric ischaemia were reported with the chief complaint of abdominal pain. A non-H. Pylori gastric ulcer was found as incidentaloma on upper gastrointestinal endoscopy. Luckily, these cases were detected early as the gastric ulcer was not perforated.¹⁰ Our presented case had come in late with peritonitis secondary to perforation of the ulcer and that made the diagnosis comparatively more accurate. Perforation of the duodenal ulcer may occur first leading to mesenteric vein thrombosis and acute mesenteric ischaemia. This concept can be reinforced by the fact that in our case, the gangrenous patches on the small intestine were patchy, which is encountered in the venous type of mesenteric ischaemia. Another possibility is, that the patient being hypertensive but non-compliant with the antihypertensive medications, the duodenal ulcer was caused by smoking and taking NSAIDs, and eventually perforated. Simultaneously there were atherosclerotic changes in the superior mesenteric artery manifested as acute mesenteric ischaemia.

Conclusion

The presence of dual findings of peptic ulcer perforation and acute mesenteric ischaemia is a rare phenomena as reported in the present case. The pre-operative diagnosis of acute mesenteric ischaemia is quite challenging, and this less prevalent condition can be masked by a commonly occurring disease like peptic ulcer perforation. Immediate necessary investigations and a good history lead to an accurate diagnosis and immediate surgery. The case presented unfortunately succumbed to other medical causes.

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Conflict of Interest: The signatory of the approval letter from the ethical review board is also the co-author of this article.

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