Case Report

Perforated Duodenal Ulcer in a 13-year-old Male

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Abstract

Duodenal ulcers are rare in the paediatric population. Therefore, it is, however, unlikely that a paediatric patient presenting with peritonitis will be due to a perforated duodenal ulcer. In our facility, we report a rare case of a perforated duodenal ulcer in a 13-year-old male who presented to the emergency with abdominal pain of 1-week duration. He had no history of peptic ulcer disease. An erect abdominal X-ray showed air under the diaphragm, which was consistent with a perforated hollow viscus. Abdominal ultrasound showed massive fluid in paracolic gutters and suprapubic region. On exploratory laparotomy, a perforated duodenal ulcer in the first part of the duodenum with 1.5L of bilious fluid in the abdomen was found. *Helicobacter pylori* test was negative. Serum gastrin was normal. This goes to show that perforated gastric or duodenal ulcers should be considered a differential diagnosis in evaluating a child with peritonitis.

Keywords: Laparotomy, perforated duodenal ulcer, Zollinger–Ellison syndrome

Introduction

Duodenal Ulcer is uncommon in the pediatric age group. Due to this fact, it is usually not considered in the differentials of a child presenting with abdominal pain. The prevalence of peptic ulceration in children undergoing endoscopy is also increasing. It is therefore important to have a high index of suspicion when evaluating a child presenting with abdominal pain. Unfortunately, because this condition is uncommon, the diagnosis is usually considered when the patient presents with complications such as duodenal perforation or upper gastrointestinal bleeding. We present a 13-year-old male who presented with severe abdominal pain and was found to have a perforated duodenal ulcer.

Case Report

A 13-year-old male presented to the emergency unit with a history of severe abdominal pain. He was referred from a local clinic where he had presented with a history of abdominal pain of 1-week duration. He described the pain as initially worse when he was hungry, but it got better after eating. He was being managed at home with antimalarials, antacids and analgesics by his mother. On the 7th day, he was brought back from school because the pain had become unbearable, and he had vomited twice. Vomiting was non-bilious. He was then brought to a hospital for further management. There was no history of chronic abdominal or epigastric pain that could suggest peptic ulcer disease or use of non-steroidal anti-inflammatory medications.

On examination, the child appeared generally unwell. He was not pale; he was afebrile and had a pulse rate of 96 bpm and blood pressure of 124/86 mmHg. His heart sounds were normal and he had good air entry bilaterally with no added sounds on respiratory examination. On abdominal examination, the patient had generalised tenderness, guarding and rebound tenderness throughout, but particularly noted around the right iliac fossa and epigastrium.

His laboratory investigations showed a Hb 11.4g/dL, a normal white cell count. Other investigations - renal function and liver function tests were normal. An abdominal X-ray showed free air under the right hemidiaphragm, suggesting a hollow viscus perforation [Figure 1]. An ultrasound revealed a large intra-abdominal fluid collection extending from the paracolic gutters to the pelvis. The appendix was not identified on ultrasound, and a computed tomography scan was not done.

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Figure 1: Upright abdominal X-ray showing free air under the right hemidiaphragm

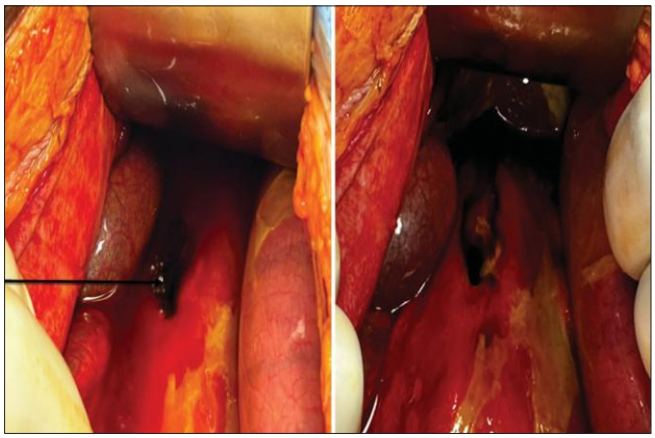


Figure 2: Intraoperative picture, showing duodenal perforation

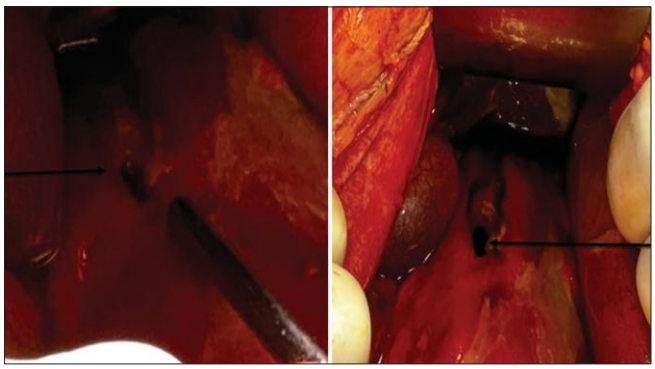


Figure 3: Intraoperative picture, showing bilous drainage from duodenal perforation

The patient was then resuscitated and prepared for exploratory laparotomy. A perforated duodenal ulcer in the first part of the duodenum was found with 1.5L of bilious fluid in the abdomen [Figures 2 and 3]. The perforation was repaired with interrupted sutures and an omental patch to buttress the repair. The patient started a diet on the post-operative day 3. Serum gastrin levels were normal. He tested negative for *Helicobacter pylori*. The patient recovered well and was discharged on the post-operative day 7. He was followed up at the clinic and remains in a good state of health.

Discussion

Reports of peptic ulcer disease in infants and children date back to 1826. A collective literature review on peptic ulcers in 243 children was published by Bird *et al*. in 1941. In a child presenting with peritonitis, peptic ulcer disease, though rare, should always be considered.

Almost all patients with peptic ulcer disease present with abdominal pain.

Duodenal ulcers are said to occur more frequently than gastric ulcers in children, with an 18:4 ratio[1]. Hua et al. reported a series of 52 patients with perforated peptic ulcer disease in the paediatric population, with 80% of the patients being male. This also corresponds with our case report of a male adolescent patient.[1]

Perforation in children has an occurrence of 0%–9% in PUD with duodenal ulcers and is seen more frequently in those older than 7 years.[2,3]

Most adolescent patients with perforated peptic ulcer will usually report to the emergency at the time of perforation.[4,5]

A plain X-ray is a useful tool as, in this patient, the presence of pneumoperitoneum confirmed perforation of a hollow viscus.

H. pylori has been implicated in most studies of peptic ulcer disease. Although in this case report *H. pylori* immunoglobulin G was negative, the primary factors associated with peptic ulcer disease are blood group O, *H. pylori* infection, sickle cell disease and Zollinger–Ellison syndrome.[6]

The route of transmission of *H. pylori* is postulated to be faecal-oral or oral-oral. Other factors associated with *H. pylori* infection in children include crowded living conditions, endemic country of origin, poor socio-economic level, immigrant children and children born of recent immigrants, infected family members and ethnicity.[7]

Zollinger–Ellison syndrome is relatively rare in children.[7] The diagnosis can, however, be confirmed by an elevated serum gastrin level, especially in a child with peptic ulcer disease. Other differentials such as parasitic duodenitis, ectopic pancreatic rests and tuberculosis duodenitis have been described as possible differentials leading to duodenal perforation.[8-10]

Children and adolescents with recurrent abdominal pains and signs suggestive of peptic ulcer disease should be fully evaluated. *H. pylori* infection should be eradicated with triple therapy when present. Upper gastrointestinal endoscopy should also be done to confirm the diagnosis.

Conclusion

Duodenal ulcer perforation is a rare occurrence in the paediatric population. It should be added to the differential diagnosis of a

child presenting with a history of abdominal pain and clinical signs of peritonitis. Proper imaging and surgical intervention are required as soon as possible to avoid complications. Duodenal ulcer perforation in children is treated by primary repair and the use of an omental patch, which can be done safely by laparotomy or laparoscopy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal patient identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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