



Pyloric perforation due to stress disorders in an adolescent girl

Ahmet Atıcı^{a,*}, Mehmet Emin Çelikkaya^a, Çiğdem El^b, Bülent Akçora^a

^a Mustafa Kemal University, School of Medicine, Department of Pediatric Surgery, 31124, Antakya, Hatay, Turkey

^b Mustafa Kemal University, School of Medicine, Department of Pediatrics, 31124, Antakya, Hatay, Turkey



ABSTRACT

Gastroduodenal perforation is a serious emergency condition. The predominance of duodenal perforation in pediatric age group shifts towards gastric perforation at later ages. However, due to thick muscle tissue pyloric perforation is seen very rarely in all age groups [3]. A 14-year-old female patient with abdominal pain lasting for one day admitted to our pediatric emergency room. During the physical examination, generalized abdominal tenderness and muscular defense were observed in all quadrants of the abdomen. Laparotomy was performed with an upper abdominal median incision. A large amount of serous, non-biliary fluid was observed in the abdomen. A perforation area of nearly 3 mm was identified on the anterior of the pylorus. Primary repair with omentopexy of the pyloric perforation was performed. On postoperative day 7, the patient was discharged without any complication. Pyloric perforation should be considered in the differential diagnosis of patients presented with epigastric pain.

1. Introduction

Gastroduodenal perforation is a serious emergency condition. Despite all treatment approaches, there are publications reporting that the rate of mortality is up to 3% [1]. Early diagnosis and treatment are very important. Gastroduodenal perforations in adults and children may be caused by several risk factors such as *Helicobacter pylori* infection, Zollinger-Ellison syndrome (gastrinoma), stress ulcers, starvation. In addition using of some chemicals including non-steroid anti-inflammatories, crack cocaine, cocaine, steroids, alcohol, salt, bevacizumab and methamphetamine can be caused this condition too [1,2]. The predominance of duodenal perforation in pediatric age group shifts towards gastric perforation at later ages. However, due to thick muscle tissue pyloric perforation is seen very rarely in all age groups [3]. The purpose of this article is to present a 14-year-old female patient with pyloric perforation whose stress disorder is detected as the etiological cause.

2. Case report

A 14-year-old female patient with abdominal pain lasting for one day admitted to our pediatric emergency room. During the physical examination, generalized abdominal tenderness and muscular defense were observed in all quadrants of the abdomen. The erect abdominal radiography showed gas under the diaphragm (Fig. 1). Total blood count and biochemical test results showed a white blood cell count of

$21 \times 10^3/\text{mL}$ and C-reactive protein level of 24 mg/L. There were no other abnormalities. Intravenous fluid therapy was started and broad-spectrum antibiotics (ceftriaxone - metronidazole) were infused prior to surgery. Laparotomy was performed with an upper abdominal median incision. A large amount of serous, non-biliary fluid was observed in the abdomen. A perforation area of nearly 3 mm was identified on the anterior of the pylorus (White arrow) (Fig. 2). Stomach, duodenum, and other intestinal structures were normal. Primary repair with omentopexy of the pyloric perforation was performed. On postoperative day 4, the nasogastric catheter was removed and oral nutrition was re-introduced. On postoperative day 7, the patient was discharged without any complication.

3. Discussion

The number of surgical interventions for peptic ulcer and its complications in children is low, however, the use of effective medical treatments decreased the number of these surgeries even further [2,4]. Gastroduodenal perforations develop on an ulcer base in most cases and peptic ulcer related perforations in children occur mostly at duodenal, juxtapyloric, or gastric localizations [2]. Although symptoms (dyspnea or recurring abdominal pain) or complications (bleeding, perforation, and obstruction) are seen in children with perforation, there were no previously known symptom or complication in our patient.

Ulcerogenic agent (*H. pylori*), mucosal injury (NSAIDs, etc.) or increased hydrochloric acid secretion are among the etiological causes of

* Corresponding author.

E-mail addresses: ahmetatici06@gmail.com, ahmetim1501@hotmail.com (A. Atıcı).



Fig. 1. The erect abdominal radiography showed gas under the diaphragm.

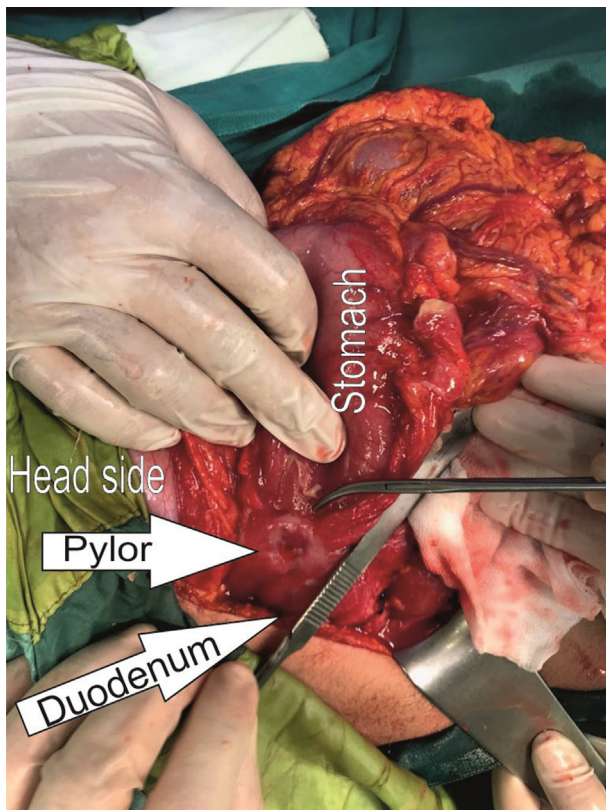


Fig. 2. A perforation area of nearly 3 mm was identified on the anterior of the pylorus (White arrow).

perforation.⁴ Pyloric perforation was described in adults due to cocaine use, concurrent with cholecystitis, and rarely over a peptic ulcer [5,6]. However, to our best knowledge, our patient is the first case of spontaneous pyloric perforation in a child in the literature. Although *H. pylori* infection is detected in 90% of perforations in the pediatric age group, our patient did not have *H. pylori* infection [2]. In *H. pylori*-negative patients, gastric ulcer or perforation related to aspirin or NSAIDs use, radiotherapy have been reported, however, our patient did not have any of these conditions [3,4]. Furthermore, our patient did not have the history of tobacco, alcohol, or any drug use. However, the patient stated that she had an intense stressful week at school previous of perforation. Abdominal ultrasonography that was performed for control purposes did not reveal any pathology. There were no symptoms of Crohn's or Zollinger-Ellison Syndrome (Gastrin: 12.6 pg/mL) in our patient.

Advanced age, comorbid conditions, perforations lasting more than 24 h are considered as poor prognostic factors [1]. Given that our patient was young and did not have comorbidities, she responded to the treatment, which was initiated in the acute period, favorably.

Although surgery is the classical treatment in these cases, conservative treatment (intravenous fluid treatment, nasogastric decompression, proton pump inhibitor) has been recommended for almost 50 years [7]. Surgery is performed with laparotomy or laparoscopically. Surgical treatment includes primary suturing of the perforation with or without omentopexy. Although very few cases have been reported so far, endoscopic entry from the defect into the peritoneal area and the repair of the defect with omentum by using an intraluminal clip or stent has also been recommended most recently [1].

In these patients, in order to reduce the possibility of recurrence and peptic ulcer, *H. pylori* eradication (proton pump inhibitor plus, clarithromycin plus amoxicillin) for 8 weeks was suggested [1,2]. However, as *H. pylori* was not detected in our patient, no treatment was planned.

A postoperative endoscopic examination is routinely recommended to identify underlying stomach cancer etc. especially in perforations developed over a gastric ulcer [1,2]. However, a routine endoscopic examination is not recommended in duodenal ulcers as the ratio of cancer in these cases is lower compared to gastric ulcers [3]. Since perforation occurred in our patient at an atypical localization, pylorus, and our patient did not have any etiology, the endoscopic examination and biopsies that was performed after 8 weeks were non-specific.

4. Conclusion

Although pyloric perforation is rare in pediatric age group, it can be life-threatening. Pyloric perforation should be considered in the differential diagnosis of patients presented with epigastric pain.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

Funding

No funding or grant support.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Conflict of interest

The following authors have no financial disclosures.

References

- [1] Søreide K, Thorsen K, Harrison EM, Bingener J, Möller MH, Ohene-Yeboah M, et al. Perforated peptic ulcer. *Lancet* 2015;386:1288–98.
- [2] Wong BP, Chao NS, Leung MW, Chung KW, Kwok WK, Liu KK. Complications of peptic ulcer disease in children and adolescents: minimally invasive treatments offer feasible surgical options. *J Pediatr Surg* 2006;41:2073–5.
- [3] Malfertheiner P, Chan FK, McColl KE. Peptic ulcer disease. *Lancet* 2009;374:1449–61.
- [4] McColl KE. Helicobacter pylori-negative ulcer disease. *J Gastroenterol* 2000;35(12):47–50.
- [5] Turner EJ, Owen Eoghan RTC, Reddy K. A 3 cm sealed pyloric perforation discovered during emergency cholecystectomy. *BMJ Case Rep* 2010:1534.
- [6] Cheng, Charles LY, Svesko V. Acute pyloric perforation after prolonged crack smoking. *Ann Emerg Med* 1994;23(1):126–8.
- [7] Antoniou SA, Antoniou GA, Koch OO, Pointner R, Granderath FA. Meta-analysis of laparoscopic versus open repair of perforated peptic ulcer. *J Soc Laparoendosc Surg* 2013;17:15–22.