Case Report/ Olgu Sunumu

DOI: 10.61845/agrimedical.1409939

Non-Traumatic Full-Thickness Duodenal Perforation: A Case Report

Non-Travmatik Tam Kat Duodenum Perforasyonu: Vaka Sunumu

Ahmet Başak[1*], Turgut Anuk[1]

ABSTRACT

Duodenal perforation is a life-threatening condition with high mortality and morbidity. In this study, we aim to present a case of spontaneous duodenal perforation that was detected and treated. The 66-year-old male patient, who applied to the emergency clinic with complaints of malaise, fever, weakness and shortness of breath, had no additional disease other than Chronic obstructive pulmonary disease and dementia. Pneumonia was diagnosed based on physical examination and imaging findings, and he was admitted to the pulmonology clinic and treated. During follow-ups, the patient developed sepsis and an acute abdominal pain. An emergency laparotomy revealed a non-traumatic spontaneous duodenal perforation, which caused near ruptured duodenum. The perforated duodenum part was resected and gastrojejunostomy was performed. The rupture of the duodenum and large duodenal perforation can occur in association with iatrogenic or trauma-related causes. In the patient who had no history of trauma, the most likely cause of perforation was thought to be peptic ulcer. It was thought that possible peptic ulcer perforation expanded with necrosis over time. In cases without a history of trauma, the possibility of large duodenal perforation or rupture should not be ruled out, and if there is suspicion of spontaneous duodenal perforation, laparotomy should not be avoided.

Key Words: Intestinal perforation, Pneumonia, Acute Abdomen

ÖZ

Duodenal perforasyon hayatı tehdit edebilen yüksek mortalite morbiditeye sahip bir durumdur. Bu çalışmada spontan duodenal perforasyon saptanan ve tedavi edilen olguyu sunmayı amaçladık. Genel durum bozukluğu, ateş, halsizlik ve nefes darlığı şikayetleri ile acil polikliniğine başvuran 66 yaşında erkek hastanın Kronik obstruktive akciğer hastalığı ve demans dışında ek hastalığı yoktu. Fizik muayene ve görüntüleme bulguları ile pnömoni tanısı koyularak, göğüs hastalıkları servisine interne edilerek tedavisi yapılmıştır. Takiplerinde sepsis ve akut batın tablosu gelişen hastanın yapılan acil laparotomisinde rüptüre olmak üzere olan nontravmatik spontan duodenum perforasyonu saptanmıştır. Perfore duodenum bölümü rezeke edildi ve gastrojejunostomi yapıldı. Duodenum rüptürü ve geniş duodenum perforasyonu iyatrojenik veya travmaya bağlı sebeplerle beraber görülebilir. Travma öyküsü olmayan hastada perforasyonun en olası nedeninin peptik ülser olduğu düşünüldü. Olası peptik ülser perforasyonunun zamana bağlı olarak zamanla gelişen nekroz ile genişlediği düşünülmüştür. Travma öyküsü olmayan durumlarda da geniş duodenum perforasyonu veya rüptürü olabileceğinden spontan duodenum perforasyonundan şüpheniyorsa laparotomi yapmaktan çekinilmemelidir.

Anahtar Kelimeler: Bağırsak perforasyonu, Pnömoni, Akut batın

1.Erzurum Regional Training and Research Hospital

Gönderilme Tarihi: 25/12/2023
Kabul Tarihi: 25/04/2024
Yayınlanma Tarihi: 30/06/2024

*Sorumlu Yazar
Ahmet Başak
Erzurum Regional Training and Research Hospital
Phone: 05375152268, E-mail: abasak54@yandex.com
ORCID: 0000-0002-8903-9993

Cite this article: Başak A, Anuk T. Non-Traumatic Full-Thickness Duodenal Perforation: A Case Report. Ağrı Med J. 2024; 2(2): 71-73

Introduction

Duodenal perforation is a surgical emergency presenting with acute abdominal pain. Although it is usually 0.5 cm in size, it can also reach several cm in size (1). Perforations larger than 3 cm are very rare and they have higher leakage, mortality and morbidity rates. In such perforations, treatment options such as partial gastrectomy and creating an omental plug by suturing the omentum to the nasogastric tube are indicated (2).

The most common presenting symptoms are severe epigastric pain, vomiting, and abdominal distension (3). In patients who cannot express their symptoms, signs of perforation may go unnoticed and may be confused with conditions such as pneumonia (4).

The medical history and physical examination play a crucial role in the diagnosis of patients presenting to the emergency outpatient clinic with non-traumatic abdominal pain. Since some patients require urgent surgical treatment while others may benefit from symptomatic therapy, achieving an accurate diagnosis rapidly is essential. While some of the causes of non-traumatic abdominal pain such as obstruction or perforation of the intra-abdominal organ, require urgent surgical intervention, metabolic and hormonal-related diseases do not require urgent surgical intervention.

We present a patient who was admitted to the ward due to pneumonia, and in subsequent examinations, a subphrenic abscess was detected, and for this reason, he was operated on and a full-thickness duodenal injury was observed.

CASE REPORT

A 66-year-old male patient presented to the emergency department with a 3-day history of general deterioration and weakness. The patient has no additional diseases other than chronic obstructive pulmonary disease and dementia. The patient had no history of trauma and did not use any medications other than inhalers. Due to dementia, the patient was unable to express his complaints and the physical examination was suboptimal and general abdominal tenderness was observed. Coarse lung sounds were heard on chest auscultation. In laboratory findings, white blood cell count was 14000 10^6/L, kreatinin was 1,16 mg/dL and CRP was 80 mg/L. There was no other laboratory anomaly. The thorax tomography scan showed an image consistent with pneumonia. The patient was admitted to pulmonology clinic. Moxifloxacin treatment was initiated for pneumonia. On the 4th day of admission, the patient had abdominal distension, tenderness in the abdomen. An increase in infectious parameters was observed; White blood cell count was 16000 10^6/L, CRP was 144 mg/L and procalcitonin was 17,15 ng/mL. A contrast-enhanced abdominal computerized tomography was performed. The tomography revealed a right subphrenic abscess and subhepatic free air (Figure 1). An emergency decision for laparotomy was made for the patient.

During exploration, omental adhesions were observed in the right upper quadrant. Upon opening the adhesions, a perihepatic abscess of nearly 1.5 liters was drained. The small bowel and colonic loops were explored, and no pathology was observed. A full-thickness perforation site was identified at the junction of the first and second parts of the duodenum. The lumen was observed to be opened up to 270 degrees (Figure 2). The duodenum was mobilized with kocher maneuver and the distal end was closed with a linear stapler. The proximal end was resected with partial gastrectomy. A Roux-en-Y reconstruction was performed, creating a gastrojejunostomy. A drain was placed in the surgical site, and the procedure was concluded.

The patient was followed up in the intensive care unit and the pneumonia treatment was continued. Apart from moxifloxacin, second generation cephalosporin and metronidazole treatment was started. The patient was not given an oral regimen for 2 days. On the 3rd day, the patient was given water containing methylene blue orally. No blue dyed fluid was seen coming from the drain. Thereupon, water intake started. As he tolerated the regimen and gas and stool were observed, soft liquid food was started on the 4th day. The patient was taken to the ward for follow-up on the 6th day. No active discharge was observed from the drain, the wound was found to be clean, the drain was removed and the patient was discharged on the 9th day. Pathological examination of the resection material revealed partial stomach-duodenum with congestion and hemorrhage.

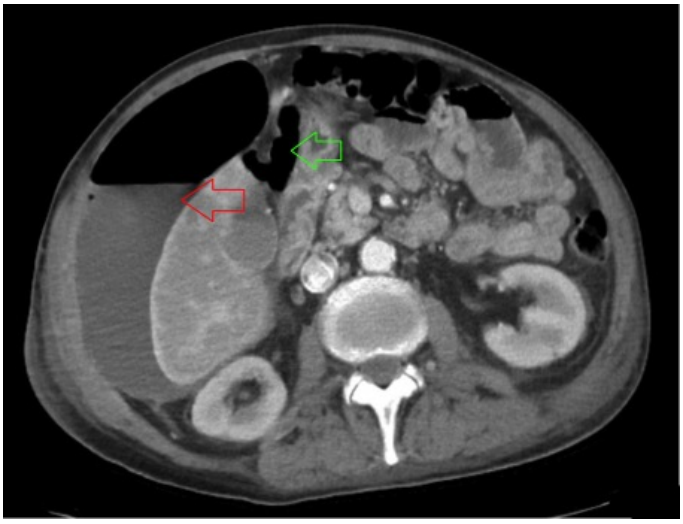

Figure 1. Abdominal tomography image; Perihepatic abscess (red arrow) and subhepatic free air image (green arrow)

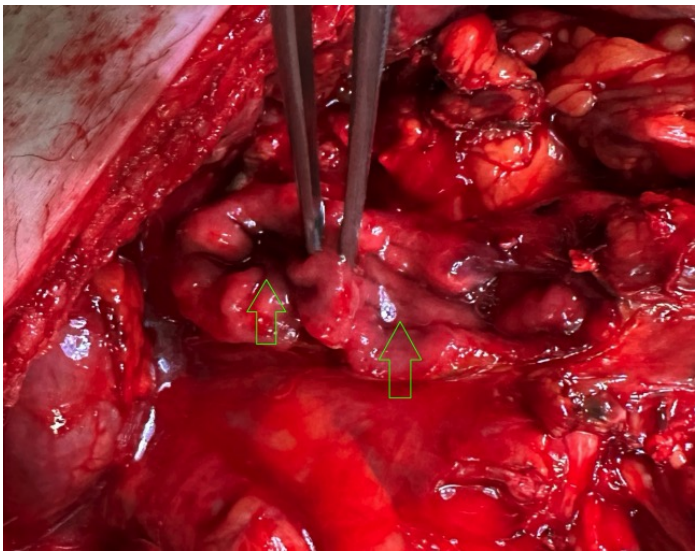

Figure 2. Double lumen appearance (green arrows) in the nearly ruptured duodenum

Discussion

Spontaneous duodenal perforation is an important reason for admission to the emergency department with acute abdominal pain. Chronic diseases such as peptic ulcer and inflammatory bowel diseases, which are not diagnosed and treated, may present to the emergency department with perforation as a form of complication (5). Approximately one-third of patients presenting to the emergency department with non-traumatic abdominal

pain require urgent surgical intervention. Spontaneous duodenal perforations, due to their deep location (retroperitoneal), pose a significant challenge for surgeons. Delays in the diagnosis and treatment of this condition are common, leading to an increase in mortality and morbidity.

Duodenal perforation is a life-threatening condition with a mortality rate ranging from 8% to 25%. The incidence has gradually decreased over time with the use of proton pump inhibitors. While peptic ulcers are the most common cause, duodenal diverticula, duodenal ischemia, infectious diseases, and autoimmune conditions may also be associated. Additionally, it can be linked to endoscopic or perioperative interventions and abdominal traumas (6).

Duodenal ulcers are often associated with Helicobacter pylori infection. Certain medications, especially nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen and aspirin, can also cause duodenal ulcers. Smoking, alcohol consumption, and stress contribute to susceptibility to duodenal ulcers as well.

Peritoneal irritation occurs when bile and stomach contents escape from the lumen. Depending on this, a physical examination such as sensitivity and defense occurs. Laboratory findings show an increase in infectious parameters. In imaging, free air under the right diaphragm can be seen in plain radiographs, while free air and free fluid under the right diaphragm and subhepatic can be seen in abdominal tomography. Once the diagnosis is made, surgical intervention is considered. Nonoperative follow-up was also thought to be successful in patients whose general condition was good and who did not have severe abdominal physical examination findings (7). Surgical abdominal exploration is performed in patients requiring surgical intervention. The perforation area is found and surgical repair is performed.

The patient's age, comorbidities, and delays in diagnosis and treatment are factors that can reduce the success of treatment. Closure of defect and omentopexy may be sufficient for perforations smaller than 0.5 cm and can be managed with lapararoscopic intervention, but in larger defects, such approaches are associated with a higher leakage rate. Various methods such as gastric diversion, duodenal resection and tube duodenumostomy have been described in the literature for large perforations (2,8,9). Full-thickness duodenal injuries or duodenal ruptures are typically attributed to iatrogenic or trauma-related causes. The surgical planning depends on the location of the rupture. Most injuries can be repaired with primary sutures without the need for diversion (9). After the repair, the abdomen is abundantly irrigated and washed to prevent postoperative intra-abdominal infection. A nasogastric tube is placed to reduce flow in posteperative period.

During postoperative follow-up, abdominal physical examination findings and vital signs are monitored. During follow-up, anaerobic strain effective antibiotics are started to prevent intra-abdominal infection and wound infection. Proton pump inhibitors are given for the treatment of peptic ulcers. The patient's oral intake is restricted until the 3rd day, and the regimen is started gradually. Gastroscopy is recommended to the patient 4-6 weeks after discharge.

Conclusion

The gastrointestinal perforation is considered in a patient who presents with an acute abdominal clinic, shows signs of increased infection, and has free air and fluid in the abdomen on imaging. Most of the time, the perforation location cannot be clearly identified by imaging. The perforation area is found with abdominal exploration. In cases of colonic or small bowel perforations, resection and anastomosis is considered and diverting ostomy is considered depending on the status of intra-abdominal infection. Primary repair is considered in gastroduodenal perforations such as peptic ulcer perforation. In cases where there is a larger defect, resection is considered.

The presented patient was initially diagnosed with pneumonia, and four days after admission, a diagnosis of perforation was established. During laparotomy, it was observed that the duodenal lumen was almost completely separated.

In the literature, duodenal rupture due to non-traumatic causes has not been reported. In our patient, the delayed diagnosis of perforation, along with general malaise, was considered as the reason for the occurrence, leading to tissue necrosis and expansion of the perforation site. Considering the poor general condition of the patient and the perceived low success rate of primary repairs, gastric diversion was performed. Additionally, a drain was placed for the purpose of monitoring potential duodenal stump leakage.

Due to high morbidiy and mortality in patients presenting to the emergency department with non-traumatic abdominal pain, the possibility of spontaneous duodenal perforation, although rare, should be considered.

Declaration of Interest: We wish to state that there are no known conflicts of interest regarding this publication.

Funding Sources: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ORCID and Author's contributions: **A.B. (0000-0001-7308-010X):** Data collection, processing, practice, analysis, literature search, writing. **T.A. (0000-0002-8903-9993):** Patients' selection, Design, Data Collection, processing, analysis, writing, critical review.

REFERENCES

1. Søreide K, Thorsen K, Harrison EM, et al. "Perforated peptic ulcer". The Lancet. Lancet Publishing Group; 2015; 386: 1288–98.
2. Gupta S, Kaushik R, Sharma R, et al "The management of large perforations of duodenal ulcers." BMC Surgery. BioMed Central Ltd.; 2005;5
3. Dodiyi-Manuel A *, Pn W, Vc E. "Presentation and managent of perforated peptic ulcer disease in a tertiary centre in South Nigeria." J West Afr Coll Surg. 2015;5:36–48.
4. Sasegbon A. "When is pneumonia not pneumonia?" BMJ Case Rep [Internet]. 2015;
5. Celik A, Altinli E, Koksal N, et al. "Management of isolated duodenal rupture due to blunt abdominal trauma: Case series and literature review." European Journal of Trauma and Emergency Surgery. 2010;36(6):573–8.
6. Anuk Turgut. "Colon perforation due to inflammatory bowel disease: Delayed diagnosis and rare complication." Ağrı Med J.; 2023;1: 15–7.
7. Cao F, Li J, Li A, et al. "Nonoperative management for perforated peptic ulcer: Who can benefit?" Asian J Surg. 2014;37(3):148–53.
8. Ansari D, Torén W, Lindberg S, et al. "Diagnosis and management of duodenal perforations: a narrative review." Scandinavian Journal of Gastroenterology. Taylor and Francis Ltd; 2019;54: 939–44.
9. Lal P, Vindal A, Hadke NS. "Controlled tube duodenostomy in the management of giant duodenal ulcer perforation-a new technique for a surgically challenging condition." Am J Surg. 2009;198(3):319–23.