Title

Retroperitoneal duodenal perforation due to COVID-19: An extremely rare case report

Authors

Eghbali, Foolad
Bhahdoust, Mansour
Khanafshar, Elham
et al.

Publication Date

2022-06-01

DOI

10.1016/j.ijscr.2022.107191

International Journal of Surgery Case Reports 95 (2022) 107191

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

Retroperitoneal duodenal perforation due to COVID-19: An extremely rare case report

Foolad Eghbali [a,*], Mansour Bhahdoust [a,b], Elham Khanafshar [c], Abdolreza Pazouki [a], Shahab Shahabi [a], Mohammad Kermansaravi [a]

[a] Department of Surgery, Minimally Invasive Surgery Research Center, Division of Minimally Invasive and Bariatric Surgery, Rasool-e Akram Hospital, Iran University of Medical Sciences, Tehran, Iran
[b] Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[c] Department of Pathology, University of California, San Francisco, California

ARTICLE INFO

Keywords:
Covid-19
Perforation
Peritonitis
Case report

ABSTRACT

Introduction and importance: Gastrointestinal (GI) symptoms are the most common extrapulmonary presentation of coronavirus disease 2019 (COVID-19) infection. GI perforation may be an unusual manifestation of COVID-19 infection.

Case presentation: We report a 45-year-old man who presented with acute abdominal pain without any respiratory symptoms to our emergency department. Investigations revealed retroperitoneal duodenal perforation and fibrotic changes in lung bases. Laboratory findings demonstrated a positive polymerase chain reaction (PCR) test for COVID-19 and mild leukocytosis.

Clinical discussion: COVID-19 related perforation of the retroperitoneal part of the duodenum is extremely rare, and to the best of our knowledge, this is the first reported case. With increasing COVID-19 infection, we might see more cases of GI perforation. In the era of COVID-19 pandemic, any abdominal signs and symptoms should alert the clinicians to consider COVID-19 diagnosis in the differential.

Conclusion: Conservative management with close monitoring, antibiotic therapy and serial examinations were completely successful. The patient's general condition improved, and he was discharged on day 7 of hospitalization.

1. Introduction

COVID-19 pandemic is the major disaster that human beings are confronted with in the last decade, with about 231 million affected patients and 4.76 million deaths until 27 September 2021 [1].

Gastrointestinal (GI) symptoms are the most prevalent extraperitoneal COVID-19 infection, with about 26.8% as a pooled analysis, including anorexia, nausea, vomiting, abdominal pain, diarrhea, altered taste, and GI bleeding [2,3].

There are a few reported cases of GI perforations due to COVID-19 [4]. To the best of our knowledge, there have been no reports of retroperitoneal duodenal perforation due to COVID-19 inion.

2. Presentation of case

A 45-year-old man was admitted to our emergency ward with a chief complaint of sudden abdominal pain with maximum intensity in the epigastrium and right side of the abdomen. He was a smoker without any significant surgical and medical history except close contact with the COVID-19 patient at home. A physical exam revealed normal vital signs but a generalized abdominal tenderness and voluntary guarding. He was neither febrile nor dehydrated. Upright chest and abdominal X-rays were normal. Bilateral pulmonary fibrosis, predominantly at the bases, was found in high-resolution computed tomography (HRCT) (Fig. 1).

Lab tests showed a positive COVID-19 PCR test in 14 cycles for RdRp genes and 15 processes for N genes (Table 1), mild leukocytosis, and negative urine toxicology (Table 2-Fig. 2).

Abdominal and pelvic ultrasound was normal without any evidence

* Corresponding author at: Minimally Invasive Surgery Research Center, Rasool-e-Akram Hospital, Niyayesh Ave, Sattarkhan St., Tehran, Iran.
E-mail addresses: eghbali.f@iums.ac.ir (F. Eghbali), mansourbahari93@gmail.coma (M. Bhahdoust), elham.khanafshar@ucsf.edu (E. Khanafshar), pazouki.a@iums.ac.ir (A. Pazouki), kermansaravi.m@iums.ac.ir (M. Kermansaravi).

https://doi.org/10.1016/j.ijscr.2022.107191
Received 9 March 2022; Received in revised form 26 April 2022; Accepted 8 May 2022
Available online 11 May 2022

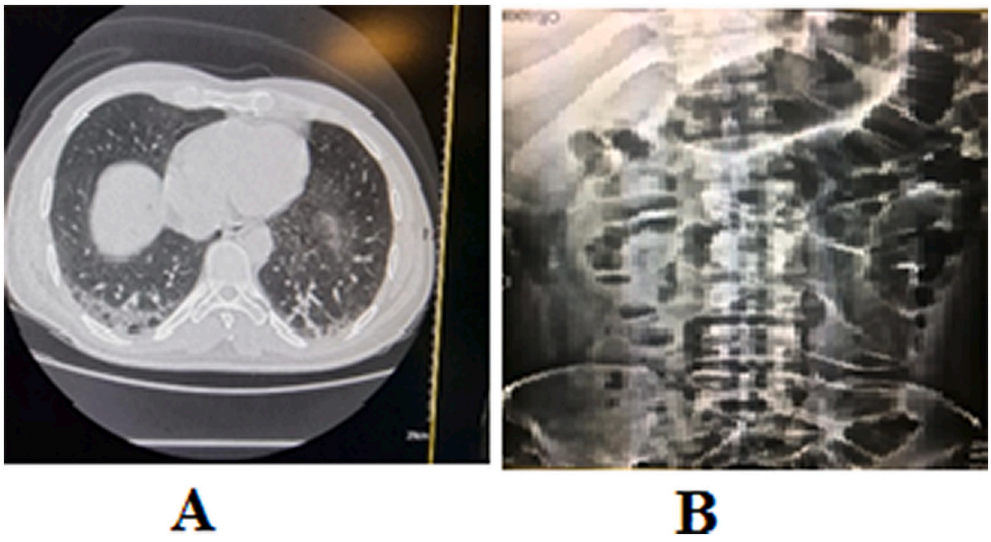

Fig. 1. A. Pulmonary fibrosis due to Covid-19 infection, B. normal abdominal X-ray.

Table 1
Positive PCR test for COVID-19 infection.

COVID-19 RT-PCR	ROJE VITAL kit
Specimen	Nasopharyngeal

Table 2
Mild leukocytosis and negative urine toxicology.

Cycle threshold for N genes	15
Cycle threshold for RdRp genes	14

of free fluid. Abdominal computed tomography (CT) scan with intravenous (IV) contrast demonstrated a contained duodenal perforation with a current of fluid to retroperitoneal space till the right gutter (Fig. 3).

Transit of the small intestine demonstrated a retroperitoneal leak from the second part of the duodenum toward the right paracolic gutter. Small intestine transit of contrast revealed leakage (Fig. 4).

Closed monitoring with serial physical exams, repeat lab tests, and antibiotic therapy (according to our GI perforation protocols) was successful. He was free of pain after 48 h. However, Covid-19 pulmonary signs and symptoms such as cough and mild dyspnea started on the second day of admission, which persuaded us to start antiviral therapy with Remdesivir (200 mg/IV loading dose and 100 mg/IV daily for five days). After five days, the patient was recovered and tolerated oral (PO) intake and discharged after seven days of hospitalization without any consequences. The work has been reported in line with the SCARE 2020 criteria [5].

3. Discussion

The prevalence of gastrointestinal symptoms in COVID-19 positive patients was about 17.6%, that anorexia is the most common symptom (26.8%), followed by diarrhea (12.5%), nausea and vomiting (10.2%), and abdominal pain (9.2%) [6].

COVID-19 related perforation of the retroperitoneal part of the duodenum is extremely rare, and to the best of our knowledge, this is the first reported case. With increasing COVID-19 infection, we might see more cases of GI perforation. In the era of COVID-19 pandemic, any abdominal signs and symptoms should alert the clinicians to consider COVID-19 diagnosis in the differential.

The pathophysiology of this complication is under investigation, but

Section Name	Test Name	Result	Unit	Flag
Patient Charge	paziresh			
Urinalysis	Profile2			
Urinalysis	AMP Amphetamine	Negative		
Urinalysis	TCA Tricyclic antidepressants	Negative		
Urinalysis	BZO Benzodiazepines	Negative		
Urinalysis	COC Cocaine	Negative		
Urinalysis	THC Marijuana	Negative		
Urinalysis	MET Methamphetamine	Negative		
Urinalysis	TRA Tramadol	Negative		
Urinalysis	MOP Morphine	Negative		
Urinalysis	BUP Buprenorphine	Negative		
Urinalysis	MTD Metadone	Negative		

Fig. 2. Urine toxicology.

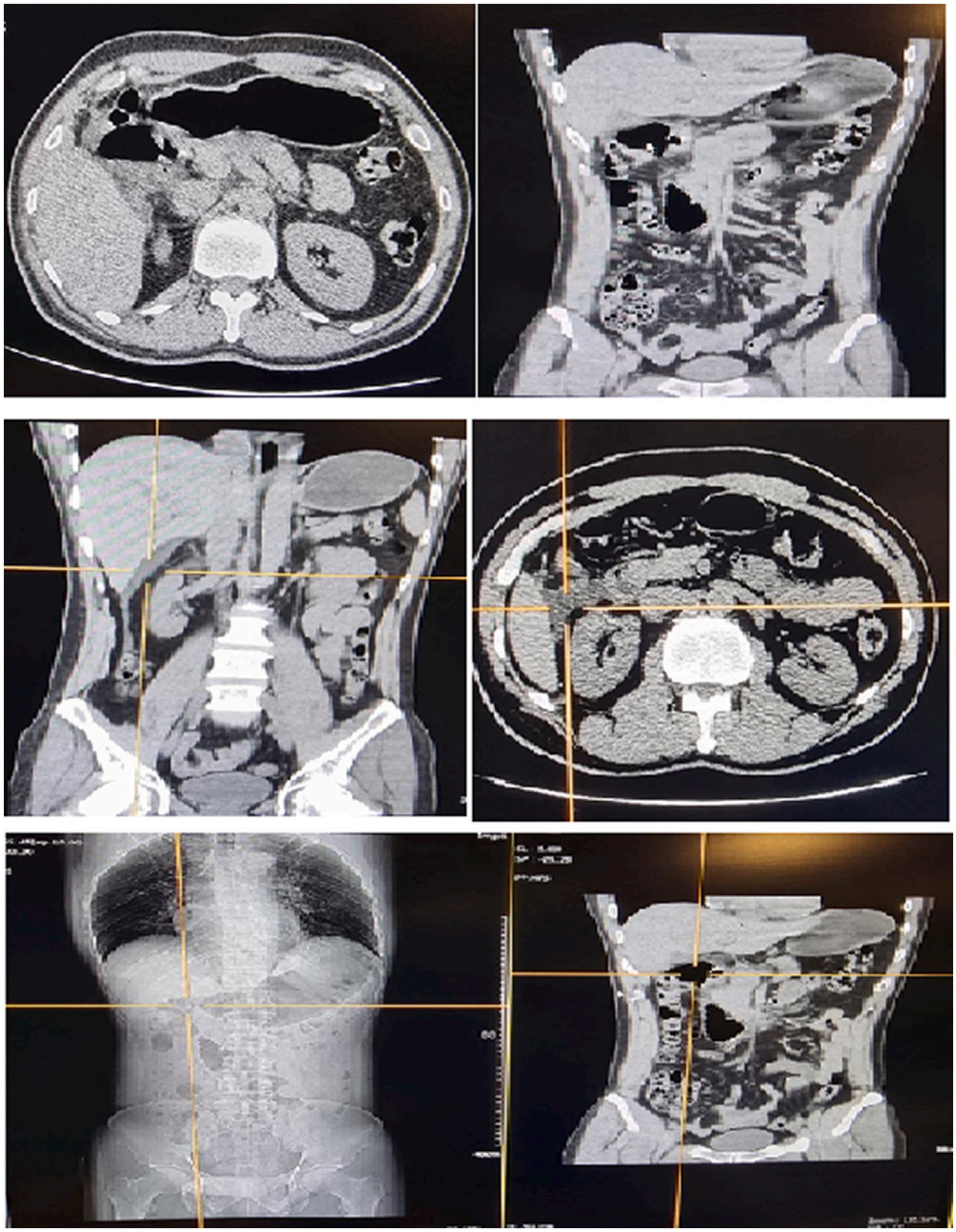

Fig. 3. Duodenal peroration (short arrow), retroperitoneal air and fluid level (long arrow).
Transit of small intestine demonstrated contained retroperitoneal leak from second part of duodenum toward right paracolic gutter.

some authors suggest the cytoplasm of gastrointestinal epithelial cells is invaded by the high affinity of the virus to ACE Inhibitor receptors in the GI tract; thus, the virus can replicate in these cells [7,8]. Neuronal injury is the other possible mechanism of injury of coronaviruses because of neurotropism [9]. In the other hand, it is documented that performing any abdominal surgery in COVID-19 patients will raise the mortality rate significantly [10]. Our patient had not any other risk factors for peptic ulcer diseases such as *H. pylori* infection, NSAIDs use, and dietary factors [11]. Smoking has been suggested as an important etiology for most PPUD cases younger than 75 years old [10]. Still, despite reports of PPUD in Covid-19 positive patients, there is no strong evidence to define the role of Covid-19 in the perforation of pre-existing peptic ulcers [12–15].

4. Conclusion

Although we can't suggest the Covid-19 infection as the risk factor for PPUD, our successful conservative approach may encourage colleagues to avoid early surgical approach in Covid-19 patients with contained GI perforation. In conclusion, we recommend evaluating each case individually to decide the best plan of treatment.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the

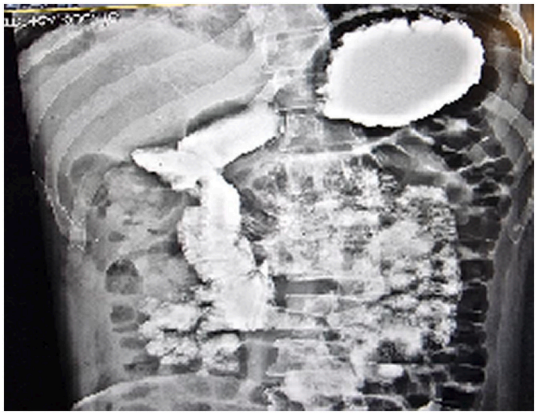

Fig. 4. Retroperitoneal contained leakage in small bowel transit (arrow head).

written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

This study was approved by the ethics committee of Iran University of medical science.

Funding

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

Guarantor

Dr. Foolad Eghbali.

Research registration number

N/A.

CRediT authorship contribution statement

Foolad Eghbali: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.
Mansour Bhahdoust: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.
Elham Khanafshar: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.
Abdolreza Pazouki: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.
Shahab Shahabi: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.
Mohammad Kermansaravi: Analysis and interpretation of data, drafting the article, final approval of the version to be submitted.

Declaration of competing interest

The authors declare that they have no competing interests.

References

[1] World health organization (WHO), covid-19 Dashboard. https://covid-19.who.int/, 2021, 27 sept.
[2] W.J. Guan, Z.Y. Ni, Y. Hu, et al., Clinical characteristics of coronavirus disease 2019 in China, N. Engl. J. Med. 382 (2020) 1708–1720.
[3] S. Sultan, O. Altayar, S. Siddique, P. Davitkov, J. Feuerstein, J. Lim, et al., AGA institute rapid review of the gastrointestinal and liver manifestations of COVID-19, meta-analysis of international data, and recommendations for the consultative management of patients with COVID-19, Gastroenterology 159 (2020) 320–334, https://doi.org/10.1053/j.gastro.2020.05.001, e27.
[4] Abhilash Perisetti, et al., Prevalence, mechanisms, and implications of gastrointestinal symptoms in COVID-19, Front. Med. (Lausanne) 7 (2020), 588711, https://doi.org/10.3389/fmed.2020.588711.
[5] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, et al., The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[6] K.S. Cheung, I.F.N. Hung, P.P.Y. Chan, et al., Gastrointestinal manifestations of SARS-CoV-2 infection and virus load in fecal samples from a Hong Kong cohort: systematic review and meta-analysis, Gastroenterology 159 (2020) 81.
[7] F. Xiao, M. Tang, X. Zheng, Y. Liu, X. Li, H. Shan, Evidence for gastrointestinal infection of SARS-CoV-2, Gastroenterology 158 (2020) 1831–1833, https://doi.org/10.1053/j.gastro.2020.02.055, e3.
[8] Tian Yuan, Rong Long, Nian Weidong, He Yan, Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission, Aliment. Pharmacol. Ther. 51 (9) (2020) 843–851, https://doi.org/10.1111/apt.15731.
[9] G. Conde, L.D. Quintana Pájaro, I.D. Quintero Marzola, Y. Ramos Villegas, Y. L. Moscote Salazar, Neurotropism of SARS-CoV 2: mechanisms and manifestations, J. Neurol. Sci. (2020) 116824, https://doi.org/10.1016/j.jns.2020.116824.
[10] R. Rasslan, J. Pessoa dos Santos, C.A. Metidieri Menegozzo, et al., Outcomes after emergency abdominal surgery in COVID-19 patients at a referral center in Brazil, Updates Surg. (Feb 24) (2021) 1–6, https://doi.org/10.1007/s13304-021-01007-5.
[11] C. Svanes, Trends in perforated peptic ulcer: incidence, etiology, treatment, and prognosis, World J. Surg. 24 (3) (2000) 277–283, https://doi.org/10.1007/s002689910045.
[12] L. He, W. Zhao, W. Zhou, P. Pang, Y. Liao, J. Liu, An emergency surgery in severe case infected by COVID-19 with perforated duodenal bulb ulcer, Ann. Surg. 272 (1) (2020) e35–e37, https://doi.org/10.1097/SLA.0000000000003958.
[13] A. Agnes, A. La Greca, F. Tirelli, V. Papa, Duodenal perforation in a SARS-CoV-2-positive patient with negative PCR results for SARS-CoV-2 in the peritoneal fluid, Eur. Rev. Med. Pharmacol. Sci. 24 (23) (2020) 12516–12521, https://doi.org/10.26355/eurrev_202012_24048.
[14] S. Safari, H. Keyvani, N. Malekpour Alamdari, A. Dehghanian, M. Razavi Hashemi, B. Nemati Honar, A. Aminian, Abdominal surgery in patients with COVID-19: detection of SARS-CoV-2 in abdominal and adipose tissues, Ann. Surg. 272 (3) (2020) e253–e256, https://doi.org/10.1097/SLA.0000000000004165.
[15] D. Mahdi, M.A. Ali, A man with an alcoholic-related duodenal perforation after losing his job due to the SARS-COV-2 pandemic, Clin. Case Rep. 9 (10) (2021), e04896, https://doi.org/10.1002/ccr3.4896.