Journal of Infectious Diseases & Therapy
ISSN: 2332-0877
Ong, et al., J Infect Dis Ther 2023, 11:5
Case Report Open Access

A Case Report on COVID-19 and Acute Ruptured Diverticulitis: The Growing Gastrointestinal Manifestations of SARS-COV2

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Abstract

Background: COVID-19 is primarily a respiratory disease but also causes a myriad of gastrointestinal symptoms ranging from diarrhea and abdominal pain to mesenteric ischemia. Acute diverticulitis, however, is a rare association and must be considered in the differential diagnosis of acute abdominal pain in patients with COVID-19.

Case presentation: A 40-year-old male with mild COVID-19 presented with sudden onset acute abdominal pain. Computed tomography scan of the abdomen revealed a ruptured diverticulitis Hinchey stage 1A in the mid-sigmoid colon. Antibiotics and bowel rest was done. Dexamethasone was added due to interval development of hypoxemia and was given oxygen supplementation. During his stay, he developed partial small bowel obstruction and was thus kept on further bowel rest. Nasogastric decompression was done. The patient improved with conservative management.

Conclusion: This report of acute diverticulitis highlights the increasing number of gastrointestinal manifestations of COVID-19 and must not be overlooked as a potential complication of a fundamentally respiratory disease.

Keywords: COVID-19; SARS-COV2; Diverticulitis; Gastrointestinal

Abbreviations: CT: Computed Tomography; ACE-2: Angiotensin Converting Enzyme 2

Introduction

SARS-COV2, the etiologic agent of the COVID-19 pandemic, was reported in late 2019 and has spread globally. The most common symptoms, being a respiratory pathogen, are fever, cough, fatigue, dyspnea and anosmia. Gastrointestinal symptoms have also been reported ranging from nausea, vomiting, abdominal and diarrhea to mesenteric ischemia. However, there has only been one other report of acute diverticulitis occurring in a COVID-19 patient. This report aims to shed light on this rare association and increase the cognizance of two seemingly unrelated disease entities [1,2].

Case Presentation

A 40-year-old male of East Asian descent was admitted to our institution due to a five-day history of fever, coryza and cough. He is a known hypertensive and is on amlodipine but has no previous hospitalizations. He is fully vaccinated against COVID-19 with an inactivated SARS COV2 vaccine. The physical exam was generally unremarkable. Laboratory evaluation revealed leukocytosis white cell count 13.26 × 103/uL, the chest radiograph showed an inflammatory process in both lower lung fields and nasopharyngeal SARS COV2 RT PCR was positive. He was started on remdesivir and supportive treatment for symptoms was given [3]. A day into admission, he developed sudden-onset abdominal pain with tenderness on the left lower quadrant. There was no overt gastrointestinal bleeding noted. Serum lipase taken was within normal limits. Computed Tomography (CT) scan of the abdomen revealed diverticulosis with diverticulitis of the mid-sigmoid colon and a small perforation along the dextrolateral wall Hinchey stage 1A. There was no evidence of bowel ischemia. He was then started on intravenous antibiotics, bowel rest and analgesics. There was interval development of hypoxemia throughout his stay and an increase in his inflammatory markers such as C-reactive protein, ferritin and D-dimer; thus, he started on dexamethasone and was placed on supplemental oxygen *via* nasal cannula. A prophylactic dose of enoxaparin was also given [4]. On the third week of admission, he was still unable to tolerate enteral feeding; thus a repeat CT scan of the abdomen revealed interval development of small bowel obstruction and a phlegmon in the previous area of diverticulitis. Percutaneous drainage of the phlegmon was not performed due to poor window for drainage. He was kept on bowel rest, feeding was given parenterally and nasogastric decompression was done. The patient gradually improved and was able to tolerate feeding. A repeat CT scan of the abdomen showed complete resolution of the phlegmon and diverticulitis. He was discharged after 29 days [5].

Results and Discussion

To the authors' knowledge, this represents the second known case of acute diverticulitis in COVID-19. It has been shown that SARS COV-2 is present in the gastrointestinal tract and can be recovered in fecal samples. While the exact pathophysiologic mechanism of

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Received: 21-Oct-2021, Manuscript No. JIDT-23-45180; **Editor assigned:** 26-Oct-2021, PreQC No. JIDT-23-45180 (PQ); **Reviewed:** 09-Nov-2021, QC No. JIDT-23-45180; **Revised:** 30-Jun-2023, Manuscript No. JIDT-23-45180 (R); **Published:** 28-Jul-2023, DOI: 10.4172/2332-0877.1000553

Citation: Ong AL, Cola J, Olasiman CD, Limquiaco JL (2023) A Case Report on COVID-19 and Acute Ruptured Diverticulitis: The Growing Gastrointestinal Manifestations of SARS-COV2. J Infect Dis Ther 11: 553.

diverticulitis and COVID-19 is unclear, current knowledge suggests direct viral entry of SARS COV 2 *via* colonocyte Angiotensin-Converting Enzyme 2 (ACE-2) receptors or a systemic inflammatory response [6]. The study done by Schieffer et al., offers a look into a viral etiology as a cause of diverticulitis in younger patients such as our case (Figure 1).

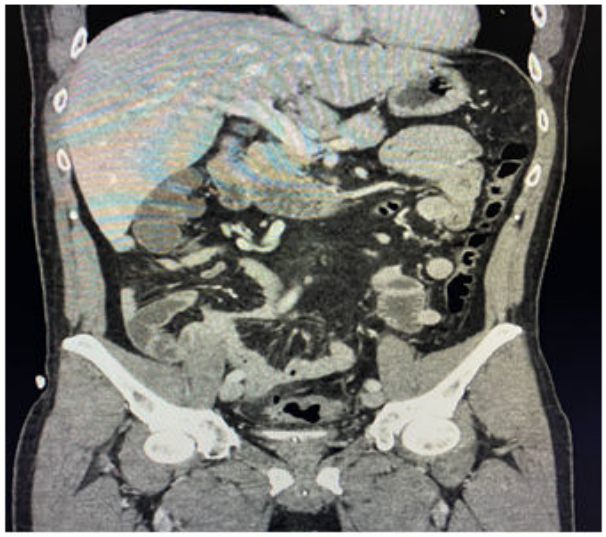

Figure 1: Sagittal views of CT scan of the abdomen showing perforation in the mid-sigmoid colon Hinchey stage 1A.

The study showed an anti-viral molecular response in resected colonic segments suggesting a viral pathogen as the agent. It is worthwhile to mention that the incidence of diverticulosis in this age group is less than 5%, with diverticulitis occurring only in another 5% in those with diverticulosis. The occurrence of diverticulitis during the viremic phase of COVID-19 should probably not be attributed merely as a coincidental finding [7]. This finding can be echoed in a different study from Sweden, which demonstrated high titers of antibodies against cytomegalovirus in patients with diverticulitis. SARS-CoV-2 infection also triggers an inflammatory response in the gut, measured by elevated fecal levels of calprotectin (a marker protein expressed mainly by neutrophils and is also seen in other inflammatory bowel disorders such as Crohn's disease. A topic of interest in recent times and one that also proves elusive is the role of gut dysbiosis. A murine model showed that ACE-2 receptor deficiency favors intestinal inflammation and increases susceptibility to colitis [8]. Altogether, direct enterocyte invasion, dysregulation of intestinal ACE-2 receptors, hypoxia, gut dysbiosis and the cytokine storm seen in COVID-19 notwithstanding might result in the myriad of intestinal complications such as diverticulitis. It is also important to consider other diagnoses such as pancreatitis, appendicitis and bowel ischemia in our patient. It remains to be seen if the aforementioned viral pathogenic mechanisms are common to other gastrointestinal manifestations or if only specific mechanisms are at play for individual disease entities [9,10].

Conclusion

Although COVID-19 associated diverticulitis remains largely unexplored, physicians need to consider common causes of acute abdominal pain in evaluating gastrointestinal symptoms in patients with COVID-19. Likewise, physicians must maintain a high degree of suspicion for COVID-19 in patients with gastrointestinal symptoms as we are still well into the pandemic and there is increasing evidence to support a broader range of symptoms of COVID-19, not simply respiratory in nature. Physicians must not hesitate to pursue diagnostic workup in those presenting with gastrointestinal symptoms that, were it not for the pandemic, would otherwise receive prompt attention and not be subscribed to simplistic viral symptomatology.

Acknowledgement

The authors would like to acknowledge the department of internal medicine and the research committee for their support in this manuscript's publication.

Guarantor of the Article

Aaron Ong accepts full responsibility for the conduct of this study.

Specific Author Contributions

AO conceived and designed the project and drafted the discussion of the manuscript. JC collected and the clinical data. CO and JL were consulted regarding the case and contributed to the discussion. All authors read and approved the final manuscript.

Financial Support

Not applicable.

Potential Competing Interests

The authors declare no conflict of interests in this study.

Ethical Considerations

The study was approved by the institutional review board of Chong Hua hospital and written consent form was obtained from the patient. Consent to publication was also obtained from the patient.

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