Computerized tomography scan findings of a patient with severe enterocolitis associated with the coronavirus disease 2019: a case report

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Abstract

Background: Currently, there is no available study about the occurrence of enterocolitis associated with the coronavirus disease 2019 (COVID-19) among adults.

Case presentation: A 56-year-old man had lower abdominal pain, distension, diarrhea, and bloody stool. Moreover, the patient presented with fever and general fatigue. Laboratory examination did not reveal leukocytosis nor neutrophilia. However, the patient's C-reactive protein level increased to 4.9 (normal range: 0.0–0.3) mg/dL. Both sputum and stool cultures had normal results. However, abdominal computed tomography (CT) scan revealed wall thickness mainly in the submucosal layer of the left part of the large intestine. Thus, real-time polymerase chain reaction test of throat swabs was performed for the diagnosis of COVID-19, and positive results were obtained.

Conclusions: We report the first case of enterocolitis correlated to COVID-19, and the patient had positive abdominal CT scan findings. This imaging modality could be effective for the diagnosis of enterocolitis associated with COVID-19.

Background

In December 2019 in Wuhan, China, several patients infected with the coronavirus disease 2019 (COVID–19) presented with pneumonia [1]. Recent studies have revealed that COVID–19 spread from human to human mainly via droplet and contact transmission. The incubation period is generally 2.1–11.1 days. However, it can last up to 14 days [2–4]. Fever, fatigue, and dry cough are the main symptoms [5], but few patients presented with hemoptysis and diarrhea [6].

The diagnosis of COVID–19 is generally diagnosed via real-time polymerase chain reaction (RT-PCR) test of throat swabs [7, 8]. However, this test may obtain false-negative results due to the use of insufficient viral materials, limitations in sample collection time, and technical errors during the swab procedure. Previous radiographic studies have shown that chest computed tomography (CT) scan has a fundamental role in the evaluation of this disease [9], and typical images reveal multiple ground glass opacities and patchy consolidations in the bilateral lung field [10].

Currently, there is no study about enterocolitis associated with COVID–19 among adults [11], and information about this infection is limited. Herein, we report the first case of enterocolitis correlated

to COVID–19, and the patient had positive abdominal CT scan findings. Thus, this imaging modality could be effective for the diagnosis of enterocolitis associated with COVID–19.

Case Presentation

A 56-year-old man living in Wakayama City presented with fever (37°C–38.8°C) and general fatigue. Five days after the onset of symptoms, the patient presented with lower abdominal pain, distension, diarrhea, and bloody stool. In terms of respiratory symptoms, he only had mild cough. The rapid influenza diagnostic tests had negative results. However, the patient still presented with the symptoms. Thus, chest and abdominal CT scans were performed 8 days after the onset of symptoms, followed by laboratory examination and sputum and stool cultures. Then, he was admitted to a respiratory medical center. His laboratory examination did not reveal leukocytosis or neutrophilia. However, his C-reactive protein level increased to 4.9 (normal range: 0.0–0.3) mg/dL. Both sputum and stool cultures had normal results. However, chest CT scan revealed patchy/punctate ground glass opacities and patchy consolidations in the bilateral lung field (Fig. 1). Meanwhile, abdominal CT scan revealed wall thickness mainly in the submucosal layer of the left part of the large intestine. In addition, the density around the intestinal wall was elevated due to parenchymal inflammation (Figs. 2, 3).

The patient was then diagnosed with allergic pneumonitis and enterocolitis. Thus, he received a single dose of intravenous corticosteroid and electrolyte and fluid replacement therapy. His digestive symptoms and fever disappeared on day 2 from admission (10 days after the onset).

On 4 day from admission (12 days after the onset), RT-PCR test of throat swabs was performed, and positive results were obtained, because of a co-worker developing the similar chest CT findings for the same period.

There is no subsequent relapse of the symptoms, and the patient was then discharged on day 8 from admission (16 days after the onset of COVID–19). Then, two RT-PCR tests were performed, and both tests had negative results.

Discussion

COVID–19 can spread from human to human mainly via droplet and contact transmission. Thus, a

rapid and accurate diagnosis is required to stop the outbreak, and the prevention and control of nosocomial infection and disease management are also important.

The common symptoms at the onset of illness are fever, dry cough, and dyspnea, which are indicative of pneumonia, and the general symptoms include muscle ache and fatigue [1, 6]. The less common symptoms are sputum production, confusion, and headache. A few individuals present with abdominal symptoms, such as diarrhea, nausea, and vomiting, and hemoptysis [12]. Moreover, approximately 39.6% of individuals with COVID–19 present with digestive symptoms based on recent reports [13], and this number will gradually increase.

The diagnosis of COVID–19 is generally diagnosed via RT-PCR test of throat swab. However, this test may obtain false-negative results due to the use of insufficient viral materials, limitations in sample collection time, and technical errors during the swab procedure [14]. By contrast, CT scan plays a fundamental role in the evaluation of this disease [9, 15]. Some studies have shown the efficacy of chest CT scan in obtaining an accurate and rapid diagnosis of COVID–19 [16]. The specific features of COVID–19 are multifocal and rapid changes, including patchy/punctate ground glass opacities and patchy consolidations along the bronchial bundle or sub pleural lungs [17, 18] [19].

Viral enterocolitis is usually caused by the norovirus, rotavirus, and cytomegalovirus. However, there are no studies showing that this condition is associated with the coronavirus. Herein, we present a rare case of enterocolitis correlated to COVID–19 in a patient who presented with mild cough. Chest and abdominal CT scans were performed. Results revealed wall thickness mainly in the submucosal layer of the left part of the large intestine and a high-density area around the intestinal wall, and pneumonia in the bilateral lung field was also observed. Enterocolitis caused by bacteria is characterized by preferential localization and severe submucosal layer thickness with specific CT scan findings of the giraffe coat sign. However, there is no change around the intestinal wall (Fig. 3) [20, 21]. Thus, the ground glass high-density area around the intestinal wall is a specific feature that represents parenchymal inflammation caused by immunoreaction and production of cytokines in COVID–19 [22].

Conclusion

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Herein, we report the first case of enterocolitis associated with COVID–19, and the patient had positive abdominal CT scan findings. Thus, this imaging modality could be effective for the diagnosis of enterocolitis correlated to COVID–19.

List Of Abbreviations

coronavirus disease 2019: COVID–19

real-time polymerase chain reaction: RT-PCR

computed tomography: CT

Declarations

Ethics approval and consent to participate: The case report has been granted an exemption from requiring ethics approval by research ethics committee of Saiseikai Arida Hospital, so this case report was conducted in accordance with the Helsinki Declaration.

Consent for publication: We informed and obtained written consent from the patient to publish this case report. Written informed consent for publication of these clinical details and clinical images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests: There are no conflicts of interest to declare.

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Authors' contributions: KT was a major contributor in writting the manuscript and a chief of the conception and design of the work, and HT, MO, MS had made contribution as a co-worker. TH had made contribution to the acquisition of this patient's data, and HI had made contribution as a co-worker and a supervisor. All authors read and approved the final manuscript.

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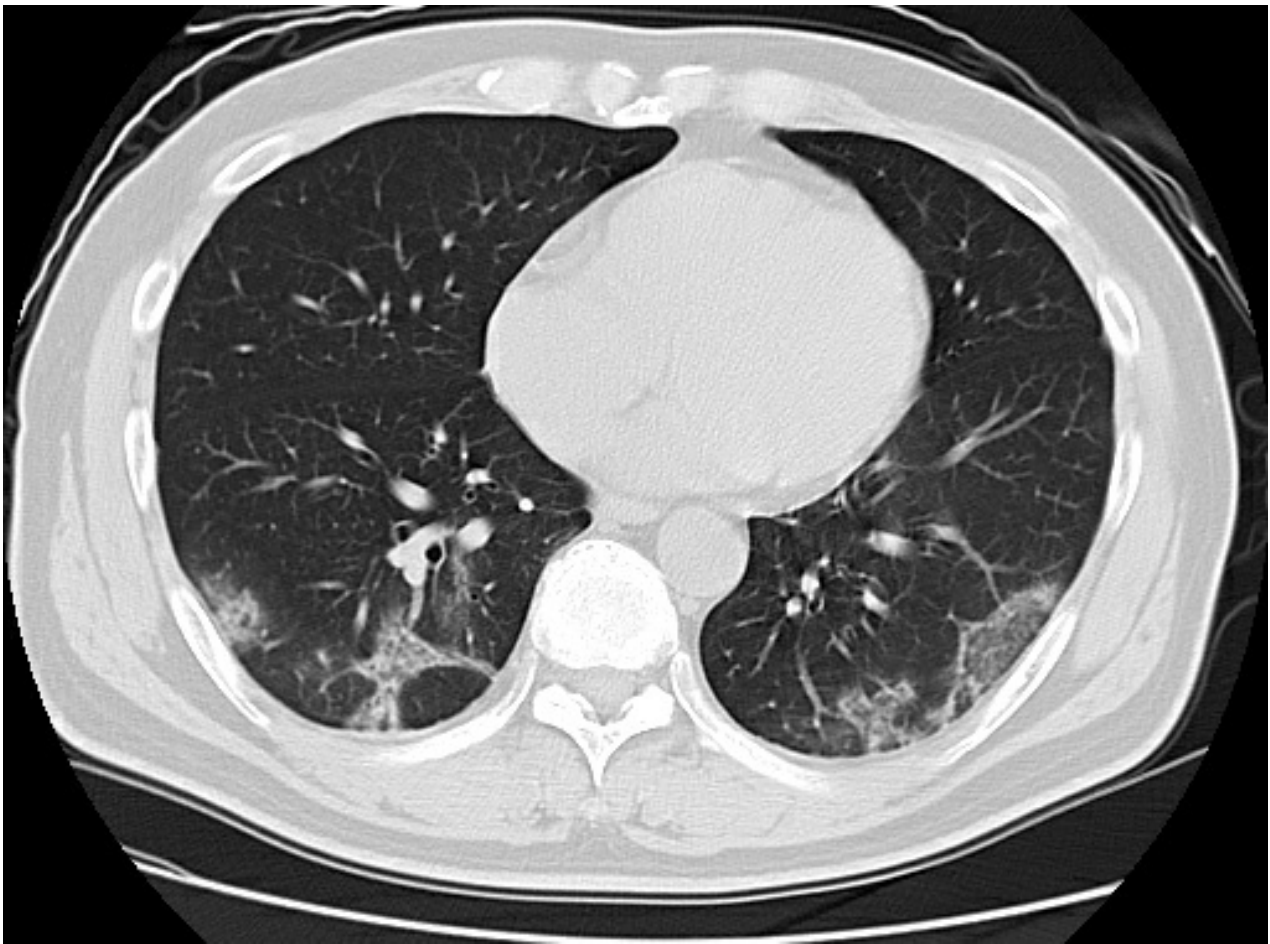
Figures

Figure 1

Chest computed tomography scan revealed patchy/punctate ground glass opacities and patchy consolidation in the bilateral lung field.

Figure 2

Abdominal computed tomography (CT) scan revealed wall thickness mainly in the submucosal layer (open allow) of the left part of the large intestine.

Figure 3

The CT density was high similar to the ground glass around the intestinal wall that

represents parenchymal inflammation (closed allow).

Figure 4

In enterocolitis caused by Campylobacter jejuni, abdominal computed tomography (CT) scan

revealed severe submucosal layer thickness in the right side of the large intestine (giraffe

coat sign). However, the density of the mesentery around the intestinal wall was normal.

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