



# Does Covid 19 have a role in Pneumatosis Cystoides Intestinalis?

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## Abstract

Pneumatosis cystoides intestinalis is a rare disease and can be diagnosed in patients who are asymptomatic or with gastrointestinal symptoms. Gastrointestinal symptoms were reported in 17.6% of patients diagnosed with Covid-19. There are many factors in the etiology of pneumatosis cystoides intestinalis, SARS-CoV-2 is also one of the infectious agents. Currently, the treatment is based on a conservative approach unless there is an acute abdomen. We aimed to present the life-threatening clinic in two Covid-19 positive patients diagnosed with pneumatosis cystoides intestinalis.

**Keywords:** Pneumatosis Cystoides Intestinalis; Pneumoperitoneum; Covid 19

## Introduction

Pneumatosis Cystoides Intestinalis (PCI) is a rare disease characterized by the presence of gas-filled cysts within the submucosa or subserosa of the intestinal wall [1]. Its incidence is approximately 0.03% [2]. Two theories stand out in pathophysiology, mechanical and bacterial. Mechanical theory includes the migration of gas to the intestinal wall due to mucosal disruption, increased mucosal permeability and increased transabdominal/intraluminal pressure. Bacterial theory includes bacteria that penetrate the gastrointestinal mucosa/submucosa and bacterial gut microbiota which converts carbohydrates/other nutrients into hydrogen gas [3]. PCI may be idiopathic or secondary to pulmonary/gastrointestinal motility/ immunological disorders, mucosal disruption, malignancies, infections, iatrogenic causes and intra-abdominal complications [4]. Clinically, PCI can be diagnosed in patients who are asymptomatic or which have gastrointestinal symptoms. On radiological examination, it is characterized by well-demarcated cysts within the walls of hollow gastrointestinal organs and small-volume pneumoperitoneum may be presented. PCI can be localized as segmental or diffuse [5]. Asymptomatic patients do

not require treatment, for mild and moderate cases conservative therapy including antibiotics and oxygen is recommended. Patients with refractory symptoms and intra-abdominal complications surgery should be considered [3]. Infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease 2019 (Covid-19). Gastrointestinal symptoms were reported in 17.6% of patients diagnosed with Covid-19 in studies [6]. We aimed to present the life-threatening clinic in two Covid-19 positive patients diagnosed with pneumatosis cystoides intestinalis.

## Case 1

A 28-year-old female patient was hospitalized in the Covid-19 pandemic clinic with diarrhea, vomiting, abdominal pain symptoms. She had a history of acute lymphocytic leukemia and bone marrow transplantation six months ago and after transplantation she received three cycles of chemotherapy. She was vaccinated with two doses of the Pfizer-BioNTech vaccine. Stool examination was negative for bacterial or parasitic infections for diarrhea. Conservative therapy was continued with the recommendations

of the infectious diseases clinic. Contrast-enhanced abdominal tomography was performed on the patient after ten days, when symptoms persisted, abdominal pain increased, and acute abdomen was found on physical examination. There was air in the wall of the large intestine from the cecum to the rectum in the computed tomography. Diagnostic laparoscopy was performed. There was

no intestinal perforation or ischemia. She had diffuse involvement pneumatosis cystoides intestinalis with in the wall of colon and nothing was done (Figure 1). The patient was taken to the Covid 19 intensive care unit. She died on the 5th postoperative day due to pulmonary complications secondary to Covid 19.

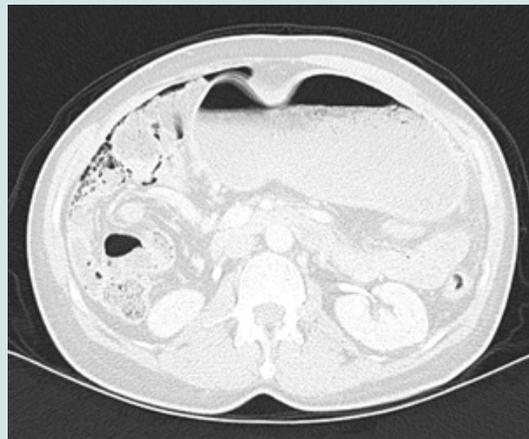


**Figure 1:** Diffuse involvement pneumatosis cystoides intestinalis with in the wall of colon.

## Case 2

A 49-year-old male patient was applied to the emergency with new onset abdominal pain. He had a history of endoscopic balloon dilatation for pyloric stenosis ten years ago and had been using prednisone for three years with the diagnosis of rheumatoid arthritis. He was on the 7th day of home quarantine after being asymptomatic Covid 19 positive and was not vaccinated. Physical examination was compatible with acute abdomen. Contrast-

enhanced abdominal tomography was performed. There was free air in abdomen and the wall of the segmental small intestine (Figure 2). Explorative laparotomy was performed. Pneumatosis cystoides intestinalis was present with segmental involvement of the ileum and jejunum (Figure 3). Intestinal perforation, ischemia or any gastrointestinal complications were not observed then the surgery was terminated. On the 10th postoperative day, the patient was discharged without complications after medical treatment containing antibiotics in the general surgery clinic.



**Figure 2:** Computed Tomography image, free air in abdomen and the wall of the segmental small intestine.



**Figure 3:** Pneumatosis cystoides intestinalis presented with segmental involvement of the ileum and jejunum.

## Discussion

Pneumatosis Cystoides Intestinalis (PCI) is an uncommon disease. Although some conditions and predisposing factors have been defined in the etiology, 15% of cases are reported as idiopathic [1-3]. SARS-CoV-2 affects many organs throughout the human body. Gastrointestinal symptoms are reported in 10-15% of Covid-19 cases and include diarrhea, nausea, vomiting and abdominal pain [7]. PCI may be asymptomatic or may present with similar gastrointestinal symptoms. These two cases reveal that Covid 19 and PCI can coexisted and that Covid 19 may be one of the predisposing factors.

Suzuki et al. reported PCI in a patient treated with methotrexate for the diagnosis of rheumatoid arthritis [8]. Also, Iitsuka et al. reported PCI in a patient who started steroid treatment due to nephrotic syndrome [9]. In 1969, Crider described PCI in a patient with chronic lymphocytic leukemia [10]. Nobori, et al. defined asymptomatic PCI after one hundred and fifteen days later in patient who underwent hematopoietic stem cell transplantation for lymphoma and was given steroids for acute skin graft versus host disease [11]. Additionally, PCI cases have been reported in lymphoma patients receiving chemotherapy, especially asymptomatic [12]. Similar to the literature, our patients have leukemia, bone marrow transplant, rheumatoid arthritis, chemotherapy and steroid use which are classified as malignancy, immunological disturbance and iatrogenic conditions in etiology. Differently, both of our cases were Covid 19 positive. Treatment in PCI is based on clinical condition and severity of symptoms. According to the literature, for mild and moderate cases conservative therapy including antibiotics and oxygen are suitable. Surgery is recommended in patients with persistent symptoms and suspected intra-abdominal complications [3]. We preferred surgery because of refractory symptoms or acute abdomen sign on physical examination.

## Conclusion

Pneumatosis cystoides intestinalis is an uncommon disease. Although there are many factors in the etiology, SARS-CoV-2 is also among the infectious agents. Currently, the treatment is based on a

conservative approach.

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