

## INTRODUCTION

**Gastrointestinal perforation (GIP)** is a life-threatening condition with mortality rate of up to 46% with administration of tocilizumab.<sup>1</sup> Tocilizumab is a monoclonal anti-IL-6 receptor antagonist used in the treatment of the profound inflammatory state of COVID-19. GIP is a known serious complication of tocilizumab as indicated in the manufacturer's package insert, and several cases have been reported regarding patients receiving tocilizumab for rheumatologic diseases.<sup>1</sup> The mechanism behind this condition, especially in patients with COVID-19, is still unclear. We describe a case of a COVID-19 patient who developed GIP during treatment with tocilizumab.

## CASE

A 61-year-old male with past medical history of hypertension and depression presented with complaints of progressively worsening shortness of breath and loss of appetite over 3 days. On presentation, he appeared **severely distressed, tachypneic, and tachycardic**. He was admitted with COVID-19 pneumonia and started on BiPAP for hypoxia. His treatment for COVID-19 pneumonia included a **10-day course of dexamethasone, 5-day course of remdesivir, 2 doses of cyclosporine, and 1 dose of tocilizumab**. On hospital day 4, he required intubation and vasopressor support.

The patient had no bowel movement since admission. A KUB X-ray on hospital day 13 was obtained which showed findings suspicious of ileus or possible small bowel obstruction. On hospital day 17, he had worsening leukocytosis, vomiting, and shock. However, his abdomen was distended, soft and nontender with bowel sounds present. Another KUB showed **marked distention of the ascending and transverse colon** which could reflect colonic ileus or bowel obstruction. Follow-up **abdominal CT showed pneumoperitoneum** and persistent dilation of the colon.

Diagnostic laparoscopy showed serosal tears due to dilation with a pinpoint perforation leaking stool and gas from the medial aspect of the right colon, along with purulent fluid in the right upper abdomen. The patient received right colectomy with end ileostomy. The pathology report from the surgical specimen showed **cecal perforation and multiple mucosal ulcers with transmural acute inflammation**. Ultimately the patient was extubated and became medically stable for discharge.

## CONTACT

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## HOSPITAL COURSE

**Hospital Day 0:**  
 Admission to ICU for COVID-19 PNA. Started on BIPAP, dexamethasone, and remdesivir

**Hospital Day 4:**  
 Intubated for hypoxia. Started on vasopressors and **tocilizumab**

**Hospital Day 17:**  
 CT abdomen with **pneumoperitoneum**. Emergent surgery

**Hospital Day 21:**  
 Patient extubated

**Hospital Day 30:**  
 Discharge to Acute Rehab facility

## IMAGING

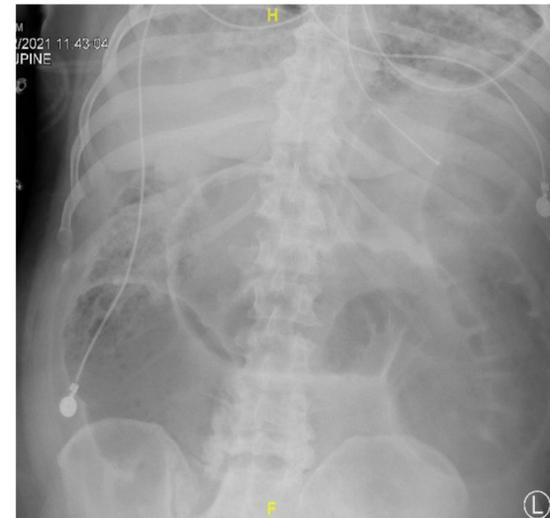


Fig 1: X-ray with colonic distension concerning for bowel obstruction

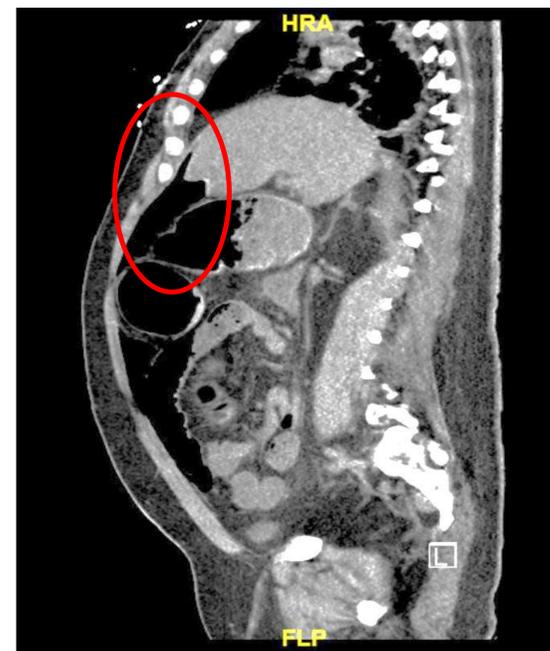


Fig 2: CT abdomen sagittal view with pneumoperitoneum (red)

## DISCUSSION

GIP is a surgical emergency that can be complicated with severe disease states such as peritonitis and COVID-19 infection. It has various causes including extrinsic and intrinsic bowel obstruction, or diminished intestinal mucosal integrity through inflammation, ischemia, or infections.<sup>2</sup> This patient was **given tocilizumab which has known risk for GIP** especially when used concomitantly with steroids which is often indicated in COVID-19 pneumonia.

**Patients with COVID-19 have underlying predisposing risk factors for GIP.** The SARS-CoV-2 virus binds the human host receptor angiotensin-converting enzyme 2 (ACE2) that is prevalent throughout the lungs and intestines. Viral infection of intestinal mucosa can alter colonic motility and lead to local ischemia due to the hypercoagulable state associated with COVID-19 infection.<sup>3</sup> Furthermore, altered hemodynamics may lead to hypoperfusion of the GI tract.

Since tocilizumab attenuates the acute phase reactant, significant elevation in inflammatory markers may be absent and intestinal perforation may go unnoticed in ventilated patients. For patients with worsening hemodynamics and abdominal distension, it is important to consider intestinal perforation secondary to adverse effects of therapeutics such as tocilizumab. Close monitoring and increased caution are advised as there are limited established guidelines. COVID-19 patients are at greater risk for perforation and providers are recommended to practice caution in patients with history of diverticulitis, generalized purulent peritonitis, lower GIP, fistula, and abscess.<sup>4</sup>

## CONCLUSION

**This case highlights the need for clinicians to be aware of adverse GIP in patients receiving tocilizumab.** COVID-19 patients have increased risk due to the unique disease state as well as concomitant administration of steroids. Additional studies are needed to evaluate the use of tocilizumab and its effect in COVID-19 cases. Alternative treatment may be necessary to avoid the high risk of developing this potentially fatal complication.

## REFERENCES

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