

**SPLENIC INFARCTION AN ACCOMPANYING PRESENTATION OF SARS-COV-2
PNEUMONIA: CASE REPORT**

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ABSTRACT

Coronavirus disease 2019 (COVID-19) is a global pandemic, clinical manifestations range from asymptomatic infection to pneumonia, adult respiratory distress syndrome, sepsis, septic shock, multi-organ failure. Coagulopathy, thromboembolism is common in severe COVID-19 due to complex mechanism. We report the rare case of splenic infarction due to splenic artery occlusion in SARS-CoV-2 pneumonia patient, who presented with left side abdominal pain along with other clinical features of pneumonia. Initially thought was an abdominal manifestation of atypical pneumonia but on detailed evaluation found to be splenic infarction due to thromboembolic complication associated with COVID-19. Splenic infarction latter complicated as splenic abscess, which complicated the overall clinical course of the patient. Splenic infarction in COVID-19 will occur due to thromboembolic occlusion of the splenic artery. Clinical presentation may range from asymptomatic infarction to hemorrhagic shock due to spleen rupture. CECT abdomen is the diagnostic modality of choice. The splenic infarction can complicate as spleen rupture, hemorrhage, splenic abscess, pseudocyst formation. Management involves good hydration, analgesia, anticoagulation, observation for any complication, and intervention required if the patient developed any complication. Prognosis is good with anticoagulation. All physicians managing COVID-19 patients should suspect splenic or other visceral ischemia or infarction if the patient present with abdominal pain. This clinical scenario required prompt investigation and management.

KEYWORDS: COVID-19, Thromboembolic complications, Splenic infarctions, Splenic abscess.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a global pandemic, clinical manifestations range from asymptomatic infection to pneumonia, adult respiratory distress syndrome, sepsis, septic shock, and multi-organ failure.^[1] Coagulopathy, thromboembolism is common in severe COVID-19 due to complex mechanism.^[2] We report the rare case of splenic infarction due to splenic artery occlusion in SARS-CoV-2 pneumonia patient, which complicated the clinical course.

CASE HISTORY

A 27 years old previously healthy patient, was admitted to our hospital with a history of fever, dry cough, breathing difficulty for 10 days, and pain in the abdomen for 3 days. On evaluation, heart rate 120/min, BP 120/72 mm of Hg, temperature 38.8°C, oxygen saturation 84% on room air, the respiratory rate more than 24/min.

respiratory system-bilateral-crackling present, per-abdomen tenderness present on the left side with minimal guarding. His significant investigations were, white blood cell(WBC) count-23.9 $10^3/uL$, Procalcitonin-1.99 ng/mL, D-dimer-6.62 ug/ml, Ferritin-1118 ng/mL, X-ray chest; bilateral consolidation, Novel corona viral RNA polymerase chain reaction (PCR) positive. He was started with oxygen therapy, broad-spectrum antibiotics; Piperacillin+tazobactam 4.5 grams(g) intravenous (IV) three times a day (TDS) and levofloxacin 500 milligrams (mg) IV once a day, antiviral: Lopinavir-Ritonavir (200+50 mg) two tablets per oral(PO) two times a day (BD) and Favipiravir 1600 mg PO BD on day 1, then 600 mg PO TDS from day 2, anti-malarial; Hydroxychloroquine 400mg PO 2 doses followed by 200mg PO BD. Due to oblivious finding in his abdomen contrast-enhanced computed tomography (CECT) chest and abdomen done which suggestive of

large bilateral pulmonary consolidation with necrosis and cavitation, splenic artery occlusion causing large splenic

infarction with liquefaction. (See image 1)

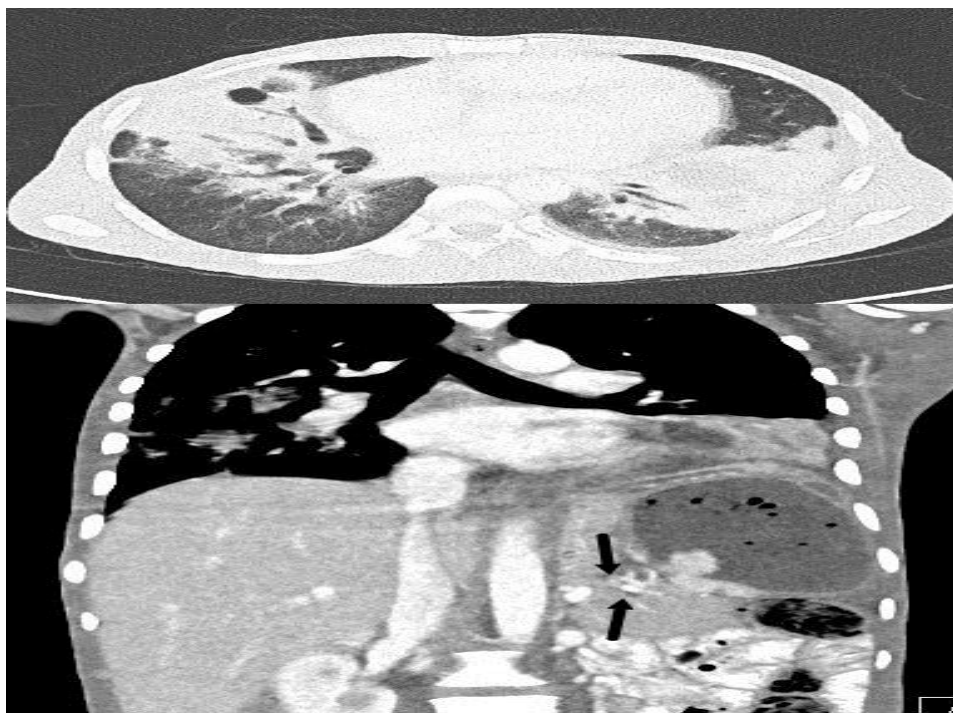


Image 1: Showing pulmonary consolidation, splenic artery occlusion (black arrow) causing splenic infarction with liquefaction.

He was then started on therapeutic anticoagulation with Enoxaparin 1mg/kg two times a day. Subsequently, CT guided aspiration of splenic collection and pigtail insertion done by an interventional radiologist. The splenic collection was found to be pus which latter grew *prevotella buccae* on culture. Because cavitary pneumonia the possibility of tuberculosis cannot be rule out, he was investigated for tuberculosis (TB), sputum for acid-fast bacilli (AFB) was negative for AFB, TB RT

PCR from splenic pus and sputum-both were negative. But even after 7 days of drainage of a splenic abscess, the patient was not improving in terms of fever and septic markers, so repeat CECT chest and abdomen was done, which suggestive persistent splenic abscess, the large intrathoracic extension of the abscess and abscess communicating with the left lower lobe cavitary consolidation. (See image 2)

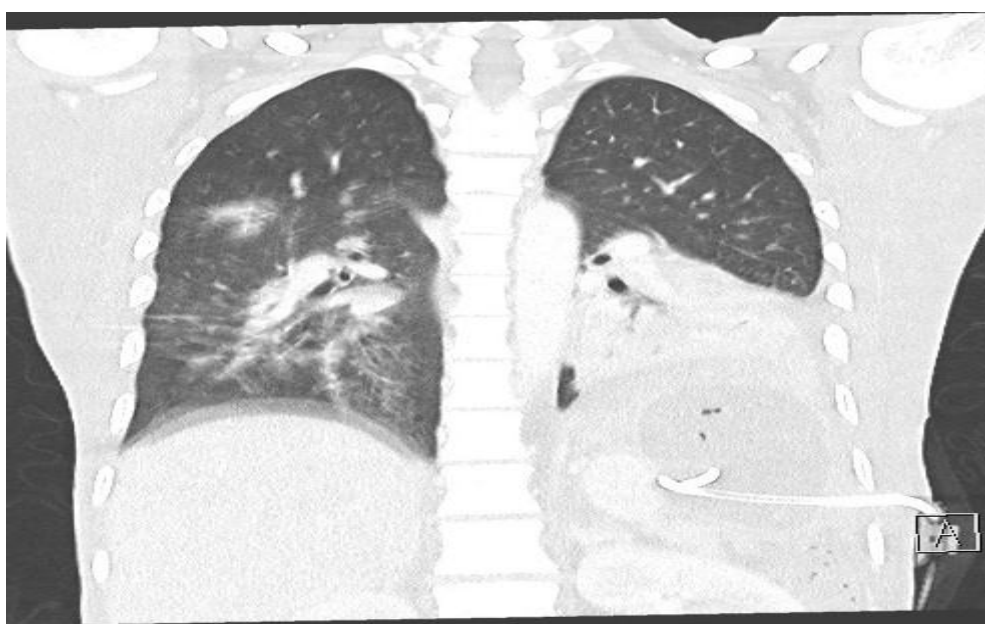


Image 2: an intrathoracic extension of splenic abscess.

He was taken for surgery, exploratory laparotomy, splenectomy, and left Intercostal drain was done. The postoperative course was complicated by septic shock; he was admitted to the intensive care unit (ICU). He required mechanical ventilation, antibiotics were changed to meropenem 1 g IV TDS and vancomycin 1 g IV BD. He was extubated on 3rd-day post-admission to ICU. He was discharged from the hospital on the 21st day in stable condition.

DISCUSSION

COVID-19 is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a newly emergent coronavirus declared a global pandemic by the world health organization. SARS-CoV-2 pneumonia usually involves bilateral lunges as ground-glass opacification or consolidation in the lung periphery.^[3] Cavitory pneumonia although rare but described in COVID-19, as observed in our patient.^[4] Coagulopathy is common in patients with severe COVID-19, both venous and arterial thromboembolism have been reported.^[5] Coagulative abnormalities COVID-19 patients not typical of disseminated intravascular coagulopathy seen in sepsis. In COVID-19 patients shows significantly elevated D-dimers, fibrinogen, and normal platelet count.^[6] Viral infections cause disruption of the endothelium, activation of platelets, and imbalance between pro and anticoagulant, this play the role in thrombus formation. The breakdown of clots is responsible for the elevation of D-dimer markers.^[6] Thrombus formation can cause end-organ ischemia or infarction. The splenic infarction is a rare clinical entity associated with COVID-19 has been reported in the literature.^[7] Splenic infarction is considered a rare cause of abdominal pain although the exact prevalence is unclear but diagnosis of the splenic infarct is rising due to increased abdominal imaging.^[8] The infarct may be segmental, or global. It is as a result of arterial or venous compromise due to the heterogeneous cause. The most common cause of splenic infarction is infiltrative hematologic diseases and thromboembolic disorder.^{[8][9]} Clinically in addition to clinical features of the underlying disease, the clinical spectrum of splenic infarction varies from asymptomatic infarction to hemorrhagic shock due to spleen rupture.^[10] Splenic infarction clinically present as fever, nausea, vomiting, left side abdominal pain, tenderness, pleuritic chest pain, left shoulder pain (Kehr sign), and splenomegaly.^[11] Investigation; nonspecific laboratory studies like elevated WBC count and Lactate dehydrogenase.^[8] D-Dimer is elevated in the case of thromboembolism.^[11] Contrast-enhanced helical CT with appropriate delay (40-50 sec.) is the gold standard for diagnosis.^[12] Complications of splenic infarction include; liquefaction, abscess formation, fibrosis, hemorrhage, pseudocyst formation, and splenic rupture.^[10] Splenic abscess secondary to pure splenic infarction is an uncommon complication.^[13] This was observed in our patient. Clinically presentations and diagnostic modality for a splenic abscess are almost similar to splenic

infarction.^[14] splenic abscess can complicate as a splenic rupture; peritonitis, rupture into the colon and erosion of abscess through the diaphragm; lung atelectasis, empyema, or pneumonia.^[15] This was observed in our patients as an intrathoracic extension of the abscess and worsening pneumonia. Management splenic infarction in COVID-19; Good hydration, analgesia, therapeutic anticoagulation, and close observation for complications.^[9] Intervention indicated if the patient develops a complication of splenic infarction; Hemorrhage or pseudocyst can be treated with partial splenectomy. A unilocular splenic abscess can be treated with percutaneous catheter drainage and antibiotics.^[15] Multilocular splenic abscess, local spread of infection, or splenic rupture require total splenectomy.^[14] Prognosis of splenic infarction is variable, the prognosis of splenic infarction due to infiltrative hematological disorder depends on the prognosis of the underlying disorder, whereas splenic infarction due to thromboembolic complication has a good prognosis with anticoagulation.^{[9][10][11]} The key message is although the abdominal pain is a common presentation of atypical pneumonia, but abdominal pain in SARS-CoV-2 pneumonia patients can be a manifestation due to splenic or other visceral ischemia or infarction. Prophylactic or therapeutic anticoagulation is recommended in all critically ill COVID-19 to prevent frequent thromboembolic complication associated with SARS-Cov-2 pneumonia.^[16]

CONCLUSION

The splenic infarction is rare manifestations due to thromboembolic complication of COVID-19. Clinically should be suspected, if patients of COVID-19 present with left side abdominal pain. CECT is the gold standard for diagnosis. Management involves good hydration, analgesia, anticoagulation, and observation for complications. Further intervention or splenectomy is required if the patient develops complications of splenic infarction.

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