Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Gastroenterology

Rapidly Progressive Pancreatitis with Multi-Organ Failure: A Severe Sequela of COVID-19

A. Handa[1*], R. Semlali[1], F. Chakor[1], O. Nacir[1], F. Lairani[1], A. Ait Errami[1], S. Oubaha[2], Z. Samlani[1], K. Krati[1]

[1]Gastroenterology Department, Mohammed VI University Hospital, Marrakech, Morocco
[2]Physiology Department, Cadi Ayyad University, Mohammed VI University Hospital, Marrakech, Morocco

DOI: https://doi.org/10.36347/sjmcr.2025.v13i03.014 | **Received:** 24.01.2025 | **Accepted:** 01.03.2025 | **Published:** 11.03.2025

***Corresponding author:** A. Handa
Gastroenterology Department, Mohammed VI University Hospital, Marrakech, Morocco

Abstract **Case Report**

Acute pancreatitis (AP) is a leading cause of gastrointestinal hospitalizations, with gallstones and alcohol being the most common etiologies. Although viral infections have been implicated in pancreatitis, the association between COVID-19 and pancreatic inflammation remains under investigation. We present a case of a 67-year-old male with no prior history of pancreatitis who developed severe AP with multi-organ failure following a SARS-CoV-2 infection. The patient experienced acute epigastric pain, nausea, and vomiting, with laboratory findings showing significantly elevated lipase levels, acute kidney injury, and transaminitis. Imaging revealed extensive pancreatic necrosis. Despite intensive supportive care, the patient progressed to septic shock, acute respiratory distress syndrome (ARDS), and ultimately fatal multi-organ dysfunction. This case underscores the potential for COVID-19 to contribute to severe pancreatic inflammation and systemic complications. Increased awareness of this association may help facilitate early recognition and management of similar cases.

Keywords: Acute pancreatitis, COVID-19, multi-organ failure, pancreatic necrosis, SARS-CoV-2, viral pancreatitis, ARDS, septic shock, gastrointestinal complications, cytokine storm.

INTRODUCTION

Acute pancreatitis (AP) is the leading gastrointestinal cause of hospitalization, predominantly driven by gallstones and alcohol consumption [1, 2]. Less commonly, viral etiologies have been implicated, with pathogens such as hepatitis viruses, mumps, cytomegalovirus, and varicella being associated with pancreatitis [3, 4]. COVID-19, caused by SARS-CoV-2, is primarily known for respiratory involvement but has demonstrated multi-systemic effects, including potential pancreatic injury [5]. While the relationship between COVID-19 and pancreatitis is not well-established, emerging case reports suggest a potential causal link. We present a case of a 67-year-old male with COVID-19 who developed rapidly progressive acute pancreatitis with multi-organ involvement, highlighting the possible link between COVID-19 and severe pancreatic inflammation.

CASE PRESENTATION

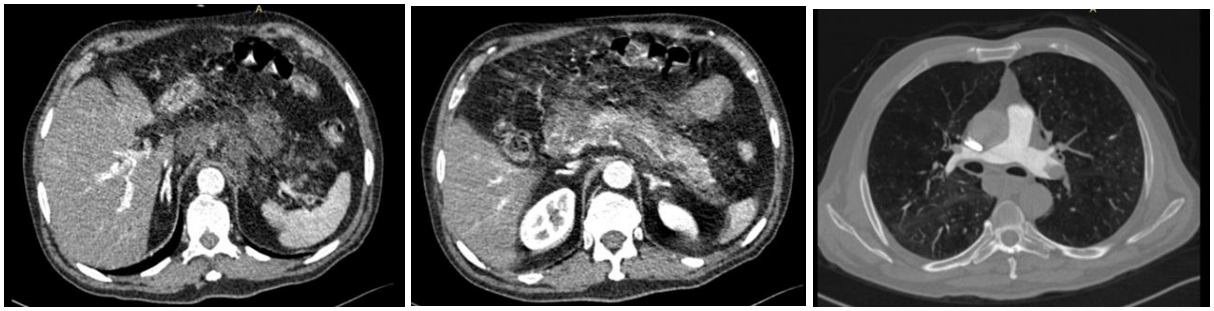
A 67-year-old male with a past medical history of chronic smoking (20 pack-years) and prior cholecystectomy presented with severe epigastric pain, intractable nausea, and vomiting for one day. He denied any history of trauma, recent medication changes, alcohol use, or chronic comorbid conditions. On initial evaluation, he was afebrile, tachycardic, and maintained an oxygen saturation of 96% on room air. Physical examination revealed epigastric tenderness without guarding or rebound tenderness.

Laboratory investigations revealed leukocytosis (227,000/µL) and elevated serum lipase (265 IU/L, >3 times the upper limit of normal). Liver function tests demonstrated transaminitis with an AST of 62 IU/L and ALT of 100 IU/L, alongside elevated total bilirubin (2.1 mg/dL) and normal alkaline phosphatase. Acute kidney injury was present with a creatinine level of 15.2 mg/dL. Lipid panel and serum calcium were within normal limits.

On hospital day 2, the patient developed atypical chest pain, non-productive cough, and diarrhea, with progressive respiratory failure requiring 6 liters/minute of supplemental oxygen. Nasopharyngeal testing for SARS-CoV-2 returned positive. Abdominal CT imaging revealed severe pancreatitis with

peripancreatic inflammatory changes extending to the duodenum and pylorus. No gallstones were identified. A chest X-ray demonstrated bibasilar infiltrates consistent with COVID-19 pneumonia.

Despite supportive care, including bowel rest, analgesia, and antiviral therapy (remdesivir, dexamethasone), the patient's condition deteriorated, necessitating high-flow oxygen support. Repeat CT imaging indicated extensive pancreatic necrosis with multiple hypodense collections and inflammatory infiltration of peripancreatic tissues. The patient subsequently developed acute respiratory distress syndrome (ARDS) and septic shock requiring multi-vasopressor support and mechanical ventilation. Blood cultures identified E. coli, and the patient was treated with broad-spectrum antibiotics. Despite aggressive management, the patient's condition continued to deteriorate, and compassionate extubation was performed per the family's wishes.



DISCUSSION

Approximately 80% of acute pancreatitis cases are attributed to gallstones and alcohol [1, 2]. Viral-induced pancreatitis remains rare, with limited evidence linking COVID-19 to pancreatic inflammation [5]. Emerging data suggest that SARS-CoV-2 may bind to angiotensin-converting enzyme 2 (ACE2) receptors in pancreatic tissue, potentially triggering local inflammation and injury [6, 7]. Our patient demonstrated rapidly progressive pancreatitis with systemic involvement, underscoring the potential severity of COVID-19-induced pancreatic injury.

Previous studies have described a small subset of COVID-19 patients developing pancreatitis without other identifiable causes [8, 9]. While a large retrospective cohort study in Spain found no significant association between COVID-19 and pancreatitis [10], other reports highlight the potential for viral-mediated pancreatic injury. The rapid progression to multi-organ failure in our patient suggests that SARS-CoV-2 may exacerbate systemic inflammatory responses, leading to severe outcomes.

Emphysematous pancreatitis, characterized by gas-forming infection within pancreatic tissues, is a rare but life-threatening complication of necrotizing pancreatitis. Our patient presented with emphysematous changes and E. coli septicemia, emphasizing the potential for secondary bacterial infections in the setting of severe COVID-19-associated pancreatitis. Prompt diagnosis and aggressive management, including broad-spectrum antibiotics and supportive care, are critical to improving outcomes in such cases.

CONCLUSION

This case highlights the potential for rapidly progressive pancreatitis and multi-organ failure as severe sequelae of COVID-19. Clinicians should maintain a high index of suspicion for pancreatic involvement in COVID-19 patients presenting with gastrointestinal symptoms, particularly when traditional etiologies are excluded. Further research is necessary to elucidate the pathophysiological mechanisms linking SARS-CoV-2 infection and pancreatic inflammation.

REFERENCES

1. Kok, K. S., Wharton, R., & Rushbrook, S. M. (2016). An Unexpected Cause of Pancreatitis. *Pancreatology*, 20, 1312-22.
2. Imam, Z., Simons-Linares, C. R., & Chahal, P. (2020). "Infectious Causes of Acute Pancreatitis: A Systematic Review. *Pancreatology*, 20, 1312-1322.
3. de-Madaria, E., & Capurso, G. (2021). COVID-19 and Acute Pancreatitis: Examining the Causality. *Nat Rev Gastroenterol Hepatol*, 18, 3-4.
4. Aday, U., Gedik, E., Kafadar, M. T., & Özbek, E. (2021). Acute Necrotizing Pancreatitis and Coronavirus Disease-2019 (COVID-19). *Korean J Gastroenterol*, 78, 353-358.
5. Hoffmann, M., Kleine-Weber, H., Schroeder, S., Krüger, N., Herrler, T., Erichsen, S., ... & Pöhlmann, S. (2020). SARS-CoV-2 cell entry depends on ACE2 and TMPRSS2 and is blocked by a clinically proven protease inhibitor. *cell*, *181*(2), 271-280.
6. Wang, L., Liang, J., & Leung, P. S. (2015). The ACE2/Ang-(1-7)/Mas Axis Regulates the Development of Pancreatic Endocrine Cells. *PLoS One*, *10*(6).
7. Batlle, D., Soler, M. J., & Ye, M. (2010). ACE2 and Diabetes: ACE of ACEs? *Diabetes*, *59*(12), 2994-2996.

8. Kumar, S. (2020). Etiology of Acute Pancreatitis in COVID-19 Patients: A Retrospective Study. *J Gastroenterol Hepatol Res*, 10, 345-357.
9. Wills, S. E., Beaufrère, H. H., Brisson, B. A., Fraser, R. S., & Smith, D. A. (2018). Pancreatitis and systemic coronavirus infection in a ferret (Mustela putorius furo). *Comparative medicine*, *68*(3), 208-211.
10. Hameed, A. M., Lam, V. W., & Pleass, H. C. (2015). Significant elevations of serum lipase not caused by pancreatitis: a systematic review. *Hpb*, *17*(2), 99-112.