

Multi Organ Involvement in a Kidney Transplant Recipient, A Case Report

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Keywords. COVID19; dialysis; end-stage kidney disease; transplantation

A 22-year old man underwent kidney transplant two years ago. Following fever and cough, epigastric pain, convulsion, vomiting and PO intolerance he had been brought to the emergency room. During evaluation in addition to pulmonary involvement with SARS-COVID-19, brain, stomach and pancreas involvements with COVID-19 infection also were detected. Hemodialysis and specific treatments were initiated. After 16 days he could be discharged ultimately.

IJKD 2021;15:155-8
www.ijkd.org

INTRODUCTION

Coronavirus disease 2019 (COVID-19) emerging in China presents with acute respiratory illness.¹ The disease presentation can range from asymptomatic to severe pneumonia with serious complications and respiratory distress.² Chronic kidney disease is a coexisting comorbidity. The COVID-19 pandemic, like previous epidemics, may cause much higher mortality in these patients.^{3,4} Extra pulmonary manifestations are common. Gastrointestinal symptoms including diarrhea, nausea, abdominal pain, anorexia, and dysgeusia have been reported to be as much as 26% in COVID-19 patients⁵ and 17% of COVID-19 patients experience abnormal level of amylase and lipase defined as pancreatic injury.¹ Kidney transplant recipient appear to be at higher risk for severe COVID-19 disease due to chronic immunosuppression and concomitant comorbidities.⁶ Here, we reported the unusual manifestation of COVID-19 in kidney transplant recipients.

CASE PRESENTATION

22 years old kidney transplant recipient with fever (38°C) and no other symptoms, take antipyretic and oral antibiotic at home. He had been transplanted 2 years ago and serum creatinine was 2.7 mg/dL (due to chronic antibody mediated rejection). His immunosuppressive regimens included Tacrolimus

3mg/d, Myfortic 360 mg TDS, and Prednisolone 5 mg/d. His past medical history included ESRD due to reflux nephropathy and Hypertension. No history of diabetes was detected. After 4 days on 17th June 2020, he attended to hospital with aggravation of weakness, lethargy, and seizure. On admission, he was drowsy: BP = 150/90 mmHg, temperature = 38.3°C, respiratory rate = 24 /min, O₂ saturation = 94% (with nasal O₂ therapy), generalized crackles in both lungs, with mild epigastric tenderness. Other exams including and neurologic ones were normal. Blood sample for evaluation of organ function (Table) and chest CT (HRCT) was done. HRCT showed consolidation and ground glass opacity with peribronchovascular patterns (Figure 1).

He didn't have any history of travel or contacts with infected patients, but for evaluating COVID-19 nasopharyngeal swab specimens were collected, and assay for SARS-CoV-2 by real-time reverse transcriptase PCR (rRT-PCR) was positive. Brain MRI showed multiple non-restricted high signal abnormalities in subcortical white matter of right frontoparietal lobe (Figure 2). Abdominal CT scan revealed diffuse gastric wall thickening, gastritis and pancreatic enlargement, pancreatitis, and peripancreatic free fluid (Figure 3). After resuscitation and control of seizure attack, the patient transferred to ICU. NG tube was fixed, and

Patient Baseline Characteristics

Patient Lab Test	At Hospitalization
WBC Count	2300
Lymphocyte Count	500
Platelet Count	18000
CRP, mg/dL	64
Creatinine, mg/dL	7.7
BUN, mg/dL	104
Na, meq/L	136
K, meq/L	4.6
Blood Glucose, mg/dL	392
AST, U/L	48
ALT, U/L	54
Amylase, U/L	570
Lipase, U/L	480
Triglyceride, mg/dL	68
Calcium, mg/dL	9.1
PH	7.29
PCO ₂	36.5
HCO ₃	17.7
CMV PCR	Negative

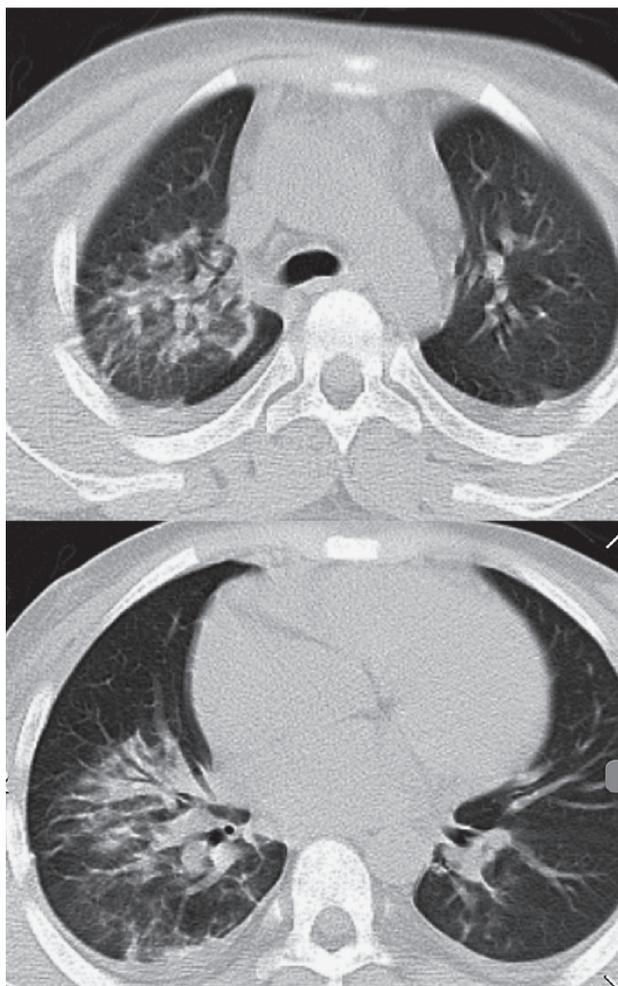


Figure 1. Axial Chest CT Scan (Consolidation & Ground Glass Opacity with Peribronchovascular Pattern)

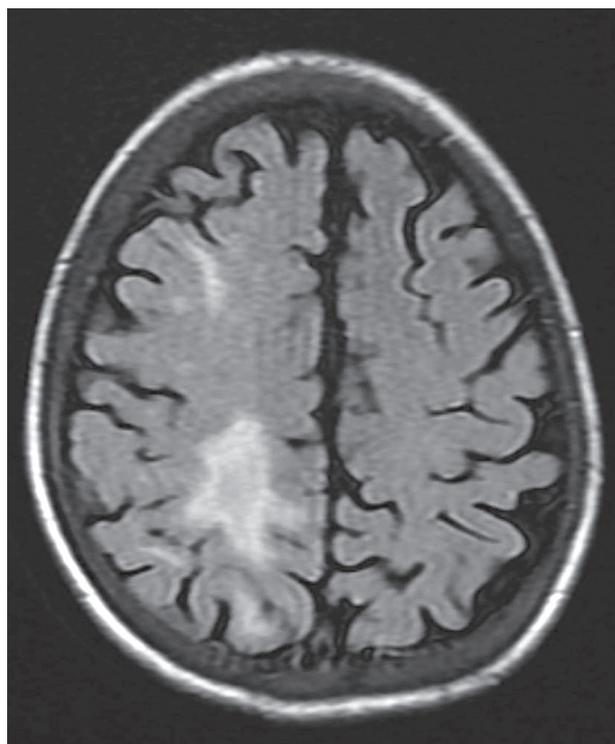


Figure 2. FIAIR Sequence Axial Plane (Multiple Non Restricted High Signal Abnormality in Subcortical White Matter of Right Frontoparietal Lobe)

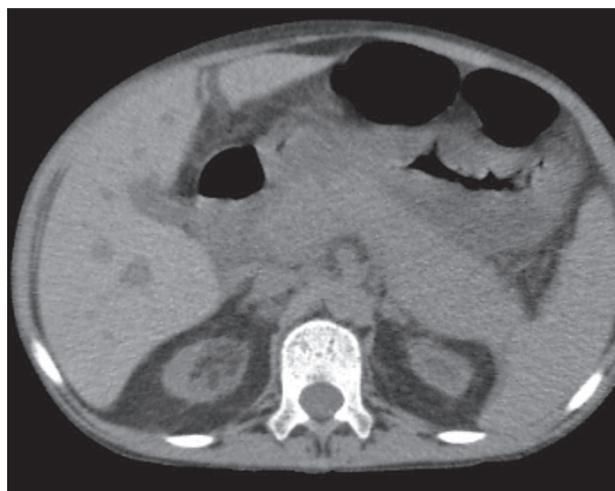


Figure 3. Diffused Gastric Wall Thickening (Gastritis), Pancreatic Enlargement (Pancreatitis), Peripancreatic Free Fluid

serum plus insulin therapy were initiated. Catheter was fixed and then hemodialysis and treatment for COVID-19 was started. Oral Lopinavir/Ritonavir 400/100 BID accompanied by broad-spectrum antibiotics (Vancomycin and Meropenem), and Hydroxychloroquine (400 mg / PO / BID) were initiated. Tacrolimus and Myfortic both had been withdrawn.

According to Ranson's criteria for acute pancreatitis score, a score of 5 was obtained regarding our patient, which indicates moderate disease activity. The amylase level increased to 1000 during hospitalization but reached 274 at discharge.

After 14 days, the patient tested negative for COVID-19 based on PCR results and on the 16th day, he was discharged and encouraged to maintain home quarantine for at least 14 days. At follow-up after eight weeks, his creatinine was fixed at 6 mg/dL and he was still on hemodialysis and insulin therapy.

DISCUSSION

In kidney transplant recipients, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) sometimes results in pneumonia and hospitalization and could progress to organ failure, acute respiratory distress syndrome, or even death.⁸

Involvement of other organs has been reported.⁸ COVID-19 may presents with acute kidney injury during kidney transplant, which causes increased mortality.⁹

Our knowledge about this virus is still incomplete. Although incidence of viral pancreatitis obscures but in viruses, mumps, HIV, cytomegalovirus, and influenza A, acute inflammation in the pancreas was reported.¹⁰ Kidney involvement can occur due to cytokine damage, and the systemic effect of COVID-19.¹¹ CNS complication of the virus has also been reported.¹² Theoretically, since the ACE2 receptor is highly expressed in pancreatic islet cells, kidneys, and brain, SARS-CoV-2 damages these organs.¹ Fan Wang *et al.* reported that pancreatic injury is not rare in COVID 19, and most of their patients had high blood glucose.¹³ The angiotensin-converting enzyme 2 receptors with high affinity mediate SARS-CoV-2 entry into cells.¹⁴ Direct cytopathic effects of SARS-CoV-2, indirect systemic inflammatory and immune-mediated cellular responses, and antipyretic drugs result in organ damage or secondary enzyme abnormalities.¹³ In our patient, gastritis, pancreatitis, encephalitis, and pneumonia occurred, and the immunosuppressed status of the case may cause multiorgan involvement. Further research is necessary to determine the SARS-CoV-2 effects on solid organ transplant recipients.

CONCLUSION

Multiorgan involvement with COVID-19 should be kept in mind in kidney transplant recipients.

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Received September 2020

Revised November 2020

Accepted January 2021