

# Case Report of 78 –year-old man with meningitis, Pulmonary Thromboembolism & SARS-Coronavirus-2 infection

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## Case Report

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# Abstract

The novel corona virus infection involve both Central & Peripheral Nervous System . Some of the presentations include: acute cerebrovascular disease, impaired consciousness, transverse myelitis, encephalopathy, encephalitis and epilepsy. Our patient was 78 year –old man with dementia and diabetic nephropathy which was admitted two times for possibly COVID19 infection. At the first hospitalization, the patient is treated with hydroxychloroquine and kaletra based on clinical symptoms and initial laboratory findings due to suspicion of COVID19 . After the negative RT-PCR test of nasopharyngeal sample for covid19 and evidence of aspiration pneumonia in CT scan, the patient was discharged with oral antibiotics. Five weeks later, he was rehospitalized with loss of consciousness, fever and hypoxemia in physical exam he had neck stiffness in all directions, So the CNS infection was suspected, the CSF sample was in favor of aseptic meningitis and second RT-PCR test of nasopharyngeal sample for COVID19 was positive but Brain MRI just showed small vessel disease without evidence of encephalitis. In the second hospitalization, he had acute renal failure, which was treated with supportive care, and also suffered from pulmonary embolism with cavitary lesions in his lungs. Meningitis with pulmonary embolism and acute renal failure have not yet reported. Our patient is the first one, so we decided to share it. This case showed different presentation of COVID19 without typical lung involvement. So we must pay attention to any sign & symptoms in a patient suspected of having a COVID19 .

## Introduction

The Coronavirus disease due to SARS-CoV-2 emerged in Wuhan city, China in December 2019 and rapidly spread worldwide.(1,2). World Health Organization (WHO) declared it a pandemic on 11 March 2020(3).By 26<sup>th</sup> May 2020 there are more than 5 million confirmed cases and about 350000 death reported.(4) The primary manifestation is respiratory but neurological features are also being reported such as headache, acute cerebrovascular disease, impaired consciousness, transverse myelitis, encephalopathy and encephalitis.(1) Meningoencephalitis just reported in two case reports.(5,6) Meningitis with pulmonary embolism and acute renal failure have not yet reported. Our patient is the first one, so we decided to share it.

## Case Report

A 78-year-old man with a history of type 2 diabetes from 10 years ago and CKD from two years ago due to diabetic nephropathy with creatinine in the range of 1.5-2mg/dl .He was treated with insulin glargine. One year ago was diagnosed with dementia and has been hospitalized several times in recent year due to high blood sugar and aspiration pneumonia. His last hospitalization was about 35 days ago in the infectious diseases ward, where he was hospitalized due to fever, sweating, vomiting and lung involvement and suspicious for COVID19 infection. Lab test showed leukocytosis which was associated with severe neutrophilia , lymphopenia and thrombocytopenia , creatinine was 1.5mg/dl (Table 1). The patient was initially treated with hydroxychloroquine and Kaletra (lopinavir/ritonavir) for a possible diagnosis of covid19, on the other hand because of suspected bacterial infection he received Imipenem

and levofloxacin. After the RT-PCR for COVID19 from the patient's nasopharynx was negative and according to the radiologist's CT scan report, the patient was more likely had aspiration pneumonia than COVID 19 (Figure 1),so the patient was discharged. Five weeks after discharge, again he was brought to emergency ward with ambulance due to fever, productive cough, hypoxemia (O<sub>2</sub>Saturation 80% without oxygen) and loss of consciousness. At emergency room the patient's vital signs were: T: 38.5<sup>0</sup>c, PR: 130 / min , RR: 22 / min, BP: 110/70 mmHg. He was awake on neurological examination, but had no visual or verbal communication and did not obey orders. The pupils are mid-size with response to light and he did not have neurologic focal deficit. He had neck stiffness in all directions. Auscultation the lungs showed crackles in base of both lungs. There were no other significant signs. The patient was transferred to the ICU and further tests such as blood and urine cultures as well as Lumbar Puncture are performed. We repeated the sample of nasopharynx for COVID19 test. The lung CT scan revealed the patchy ground glass opacities in left upper lobe ,accompanied by peri-bronchial thickening and mild pleural effusion on the left side (CORADS- 4).(figure2) In the CSF sample, the protein and sugar were normal, but white blood cells was 60 with predominance of PMN(90%). RT- PCR COVID19 was requested in the CSF sample which was negative. Procalcitonin was more than 10, and ferritin, D-dimer were also high. Creatinine was also increased compared to the previous hospitalization .(Table1)CT scans of paranasal sinuses showed no evidence of sinusitis, CT scan of the brain showed generalized atrophy, and only small vessel disease was reported in Brain-MRI.(figure3) All patient's cultures were negative. CSF sample for herpes virus and tuberculosis was also negative. Therefore, patient was diagnosed with aseptic meningitis due to covid infection and pneumonia, with acute on chronic renal failure which was treated with meropenem, linezolid and fluid therapy. The patient's blood sugar was high at the beginning of admission, which was controlled with basal &short acting insulin. In the course of hospitalization, the patient's fever was stopped after 48 hours and the patient's level of consciousness increased on the fourth day of hospitalization as he made eye and verbal communication. On the 14th day of the patient's hospitalization, suddenly he became tachycard and tachypenic, we suspected to pulmonary thromboembolism so have done pulmonary artery CT angiography and color doppler ultrasound of the veins of both lower limbs which was normal, the CT showed thrombosis in the sub-segmental of right upper lobe branches, in the parenchymal cuttings of the lungs, a consolidation with cavity was evident in the anterior segment of the LUL. Since the thrombosis was sub-segmental so we just continued anticoagulant (heparin) as prophylaxis .After three weeks of treatment with improvement of general condition he was discharged.

## Discussion

COVID19 involve both Central & Peripheral Nervous System some of the presentations include: dizziness, headache, acute cerebrovascular disease, impaired consciousness, transverse myelitis, encephalopathy, encephalitis, epilepsy, hyposmia (1). In our patient, he was initially treated as possible covid19 infection for six-day course, but because CT scans of the lungs was not in favor of covid19 and the RT-PCR of covid19 was negative, therefore the treatment of covid19 was stopped and the patient was discharged with oral antibiotics for aspiration pneumonia. At the next visit, five weeks later, due to clinical signs and

physical examinations that raised the possibility of CNS involvement and the pulmonary opacities, (CORADS 4), was hospitalized and evaluated. The second time nasopharyngeal swab sample for RT-PCR COVID 19 was positive. The acute meningitis panel and HSV & TB at the CSF were all negative and the pattern was consistent with aseptic meningitis because sample was taken at the first 24 hours of infection. Therefore, the predominance of PMN can be explained because in viral meningitis, PMN can predominate first and then lymphocytes increase. Since the treatment of aseptic meningitis is usually supportive, so the patient just treated for pneumonia. Rate of thromboembolic events in severe cases of covid19 is higher. In this patient presence of thrombosis is another important sign of severe disease, coincidence of these two complications, meningitis and thrombosis is rare and requires more studies.

## Declarations

We (authors) declare no conflict of interest. We reported a case and our works as part of standard guidelines and regulations. Our patient has dementia and impaired judgment so we ask permission from his greatest son to participate and publish the case.

## References

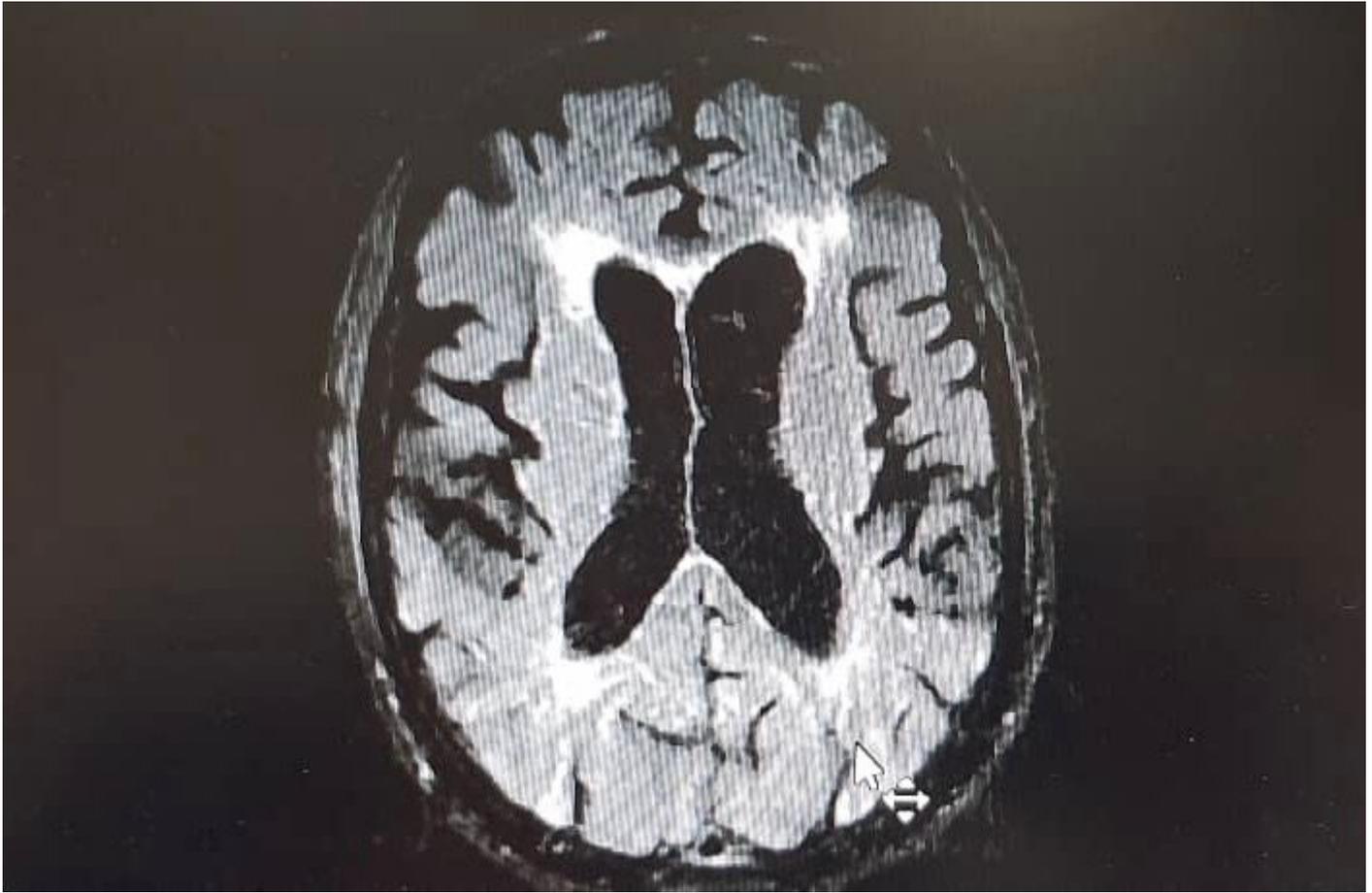
1. Ahmad and F. A. Rathore, Neurological manifestations and complications of COVID-19: A literature review, *Journal of Clinical Neuroscience*, <https://doi.org/10.1016/j.jocn.2020.05.017>.
2. Zhu Na, Zhang Dingyu, Wang Wenling, Li Xingwang, Yang Bo, Song Jingdong, Zhao Xiang, Huang Baoying, Shi Weifeng, Lu Roujian, Niu Peihua, Zhan Faxian, Ma Xuejun, Wang Dayan, Xu Wenbo, Wu Guizhen, Gao George F, Tan Wenjie. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020;382(8):727–33. <https://doi.org/10.1056/NEJMoa2001017>.
3. World Health Organization. Pneumonia of unknown cause – China. Disease outbreak news. 5 January 2020 Available at <https://www.who.int/csr/don/05-january-2020-pneumonia-of-unknown-cause-china/en/> (accessed 22nd April 2020).
4. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report – 127 <https://www.who.int/docs/default-source/coronaviruse/situationreports/20200526-covid-19-sitrep-127.pdf>. (accessed 26 nd May 2020).
5. Takeshi Moriguchi, Norikazu Harii, Junko Goto, et al. A first case of meningitis/encephalitis associated with SARS-Coronavirus-2. *International Journal of Infectious Diseases* 94 (2020) 55–58. <https://doi.org/10.1016/j.ijid.2020.03.062>.
6. Raphaël Bernard-Valnet, Beatrice Pizzarotti, Angelica Anichini, et al. Two Patients With Acute Meningo-Encephalitis Concomitant to SARS-CoV-2 Infection. *Eur J Neurol*. 2020 May 7. doi: 10.1111/ene.14298.

## Tables

Table 1: Lab tests at first and second admissions of patient

Data	First admision	Second admision	Discharge day	Normal range
White blood cell	23*10 <sup>3</sup> /μL	14.3*10 <sup>3</sup> /μL	8.1*10 <sup>3</sup> /μL	4-10
Neutrophil	93%	87%	84.3%	40-60
lymphocyte	3%	3%	9.2%	20-40
RBC	5*10 <sup>6</sup> /μL	4*10 <sup>6</sup> /μL	3.5*10 <sup>6</sup> /μL	4.6-6.2
hemoglobin	13.6g/dl	11g/dl	10g/dl	12-18
hematocrite	46%	35.7%	30.6%	36-52
platelet	52*10 <sup>3</sup> /μL	97*10 <sup>3</sup> /μL	107	130-450
BUN	31mg/dl	66.5mg/dl	27.5mg/dl	7-21
cretinin	1.6mg/dl	2.8mg/dl	1.4mg/dl	0.8-1.4
CPK	22	31U/L	27U/L	<195
LDH	338 U/L	472U/L	258U/L	230-460
ESR	35	40	25	
CRP	79	30.6	4	<5 negative
D-DIMER	-	3.2mg/dl	-	<0.2 negative
fibrinogen	-	373%	-	200-400%
ferritn	-	1846ng/ml	840	4-341ng/ml
procalcitonin	-	>10/μ g/L	-	<0.5:negative
PT	14sec	14.8sec	14sec	10-14
PTT	35sec	38sec	34sec	24-40
INR	1.2sec	1.3	1	-
AST	14U/L	27	10U/L	<38
ALT	15U/L	15	12U/L	<40
ALP	120U/L	214	90U/L	98-279
CSF:				
PROTEIN	-	21mg/dL	-	21-38
glucose	-	171mg/dl	-	-
WBC	-	60	-	0
Neutrophil	-	90%	-	0
Lymphocyte	-	10%	-	0
Troponin	0	0	0	>.02 POSITIVE

## Figures



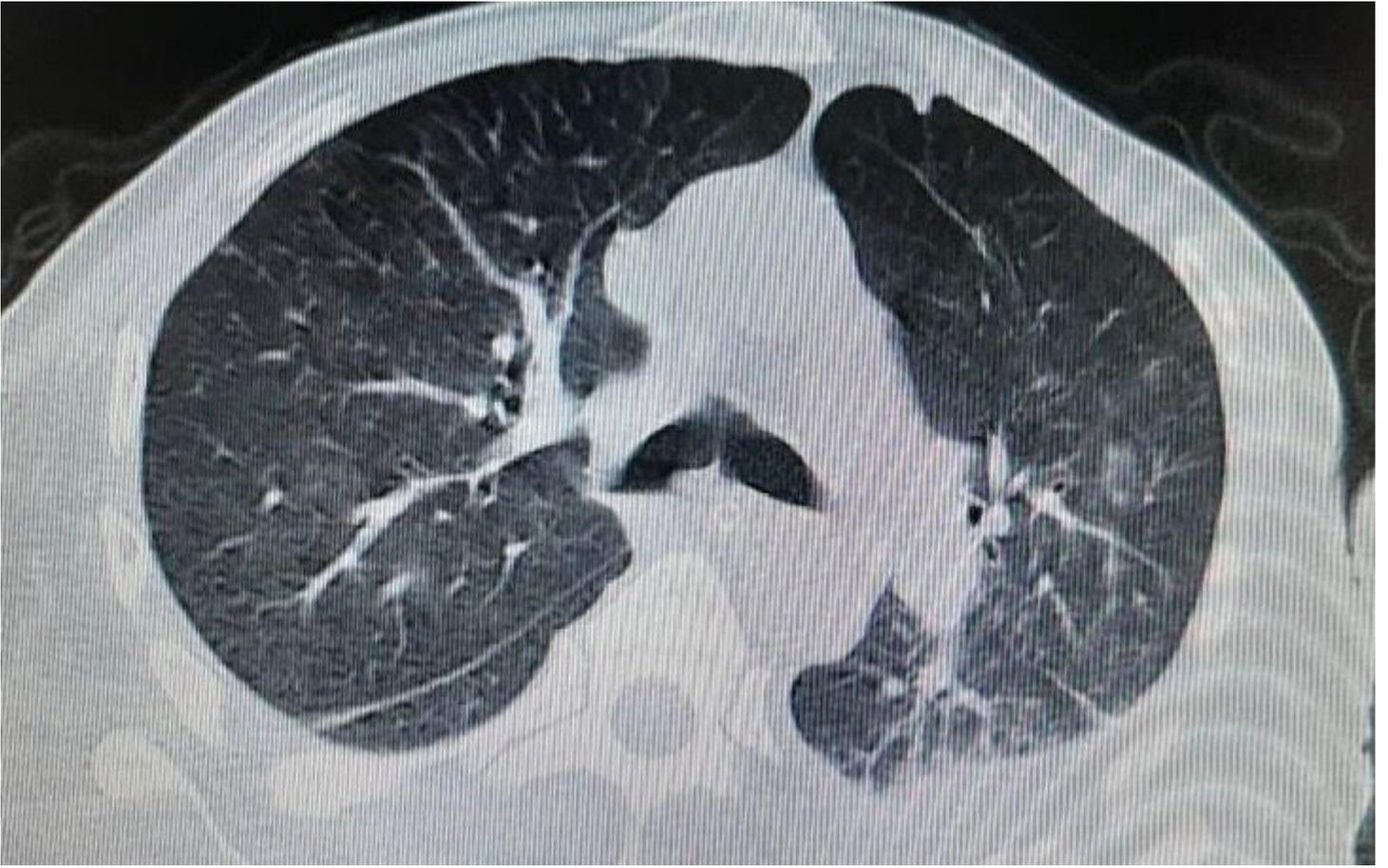
**Figure 1**

Brain MRI



**Figure 2**

Pulmonary artery CT angiography



**Figure 3**

Lung CT Scan