



# Successful Treatment of Severe COVID-19 in a Kidney Transplant Recipient with Tocilizumab

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## INTRODUCTION:

The World Health Organization declared the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak a pandemic on March 11, 2020.<sup>1</sup> Coronavirus disease (COVID-19) pneumonia in kidney transplant recipients (KTR) represent a new challenging condition for nephrologists as they are prone to severe infection. COVID-19 is transmitted via droplets or direct contact via the respiratory tract and commonly resulting in pneumonia and acute respiratory distress syndrome (ARDS). ARDS in COVID-19 infection is related to “cytokine storm” with surge of interleukin-6 (IL-6). The IL-6-receptor blocker (Tocilizumab) is known to modulate host immune response.

## METHOD:

A case report of a KTR in Hospital Sultanah Aminah who received Tocilizumab for severe COVID-19 infection.

## CASE:

A 40-year-old woman with unknown aetiology of chronic kidney disease, had a kidney transplantation from a deceased donor in 2019. The immunosuppressive therapy includes Everolimus (0.75mg BD), Prednisolone (10mg OD) and Tacrolimus (2mg OD). She had completed 2 doses of COVID-19 vaccine (Pfizer) on 15<sup>th</sup> July 2021.

On 19<sup>th</sup> October 2021, patient developed sore throat, cough, ageusia, anosmia, headache and running nose. Hence, a nasopharyngeal swab for SARS-CoV-2 was performed at a local clinic on 21<sup>st</sup> October 2021 which showed positive (CT value of RDPR=27.32; N-NA; E=25.79). She was referred to our centre on 23<sup>rd</sup> October 2021.

On day 1, patient appeared comfortable with respiratory rate of 20 breath/minute. Her peripheral capillary oxygen saturation was 96% under ambient air. She was afebrile with blood pressure 145/92 mmHg & heart rate of 120 beats/minute. Chest radiograph (Figure 1) revealed bilateral lower zones with multifocal alveolar opacity suggestive of bronchopneumonia. Laboratory investigations showed increased white cell count (WCC) 12.7X10<sup>9</sup>/L with normal absolute lymphocyte count (ALC) level, C-reactive protein (CRP) 250.1mg/L, ferritin 157.20µg/L.

On day 2, there was a new spike of fever (37.8°C), hence the initiation of Tazocin (2.25g TDS). On day 3, she developed exertional hypoxia where saturation dropped from 95% to 92% under ambient air. Oxygen therapy through nasal prong (3 L/min) and intravenous (I.V.) Dexamethasone (8mg OD) were started. On day 5, patient’s oxygen saturation deteriorated, requiring venturi mask (60%) to maintain saturation of >95%, Laboratory investigations showed increasing WCC 17.1X10<sup>9</sup>/L, neutrophil lymphocyte ratio of 18, lymphopenia (ALC 0.9X10<sup>9</sup>/L), acute kidney injury (non-oliguric) and transaminitis. Repeated chest radiograph (Figure 2) was as status quo. One dose of Tocilizumab 400mg was administered, and I.V. Dexamethasone was increased to 24mg daily, Tazocin was escalated to Meropenem (500mg BD) and other immunosuppressant medications were withheld.

Within the next 3 days, clinical improvements were observed with decreased oxygen requirement, reducing CRP trend and partial resolution of chest radiograph findings. Patient was discharged well after 2 weeks of admission.

Day Of Admission	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 12	Day 16
Day of Illness	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 15	Day 19
WCC (X10 <sup>9</sup> /L)	12.7	13.0	8.8	17.1		9.7	7.6	5.9		9.4
ALC (X10 <sup>9</sup> /L)	2.07	0.9	0.9	0.9		0.6	0.5	0.4		1.8
Urea (mmol/l)	8.8	11.4	13.3	11.6	13.1	15.3	16	16.7	16.8	11.4
Creatinine (µmol/l)	244	297	262	291	243	218	209	201	171	165
EGFR (mL/min/1.73m <sup>2</sup> )		16	19	17	21	24	25	26	32	33
ALT (U/L)	75	45	43	92		65	48	42		54
AST (U/L)	37	44		148			26	26		
LDH (U/L)	280	335		527			455	427		
CRP (mg/L)		250.1		139.5			42		6.0	1.7
Ferritin ( µg/l)		157.20								
Oxygen Requirement				VM60%	VM60%	VM60%	VM60%	VM40%	VM40%	
PaO2/FIO2 (P/F ratio)				162	145	117	185	260	312.5	

Table 1: Clinical and laboratory data before and after Tocilizumab injection.  
ALT: Alanine transaminase; AST: Aspartate aminotransaminase; LDH: Lactate dehydrogenase; CRP: C-reactive protein

## RESULTS :

The patient’s condition responded to Tocilizumab treatment by reduced oxygen requirement and partial resolution of chest radiograph findings, without evidence of transaminitis and worsening of acute kidney injury. Upon follow up 2 weeks after discharged, chest radiograph revealed complete resolution of lung findings (Figure 6).

## CONCLUSION :

Tocilizumab is used in moderate to severe cases of COVID-19 pneumonia where hyperinflammatory state or cytokine-release syndrome is present <sup>2,3</sup>. Despite limited data related to the use of Tocilizumab in transplantation, there are encouraging reports showing very few side effects <sup>4, 5, 6</sup>. More evidence is needed to confirm its efficacy in immunocompromised patients with COVID-19 infection.

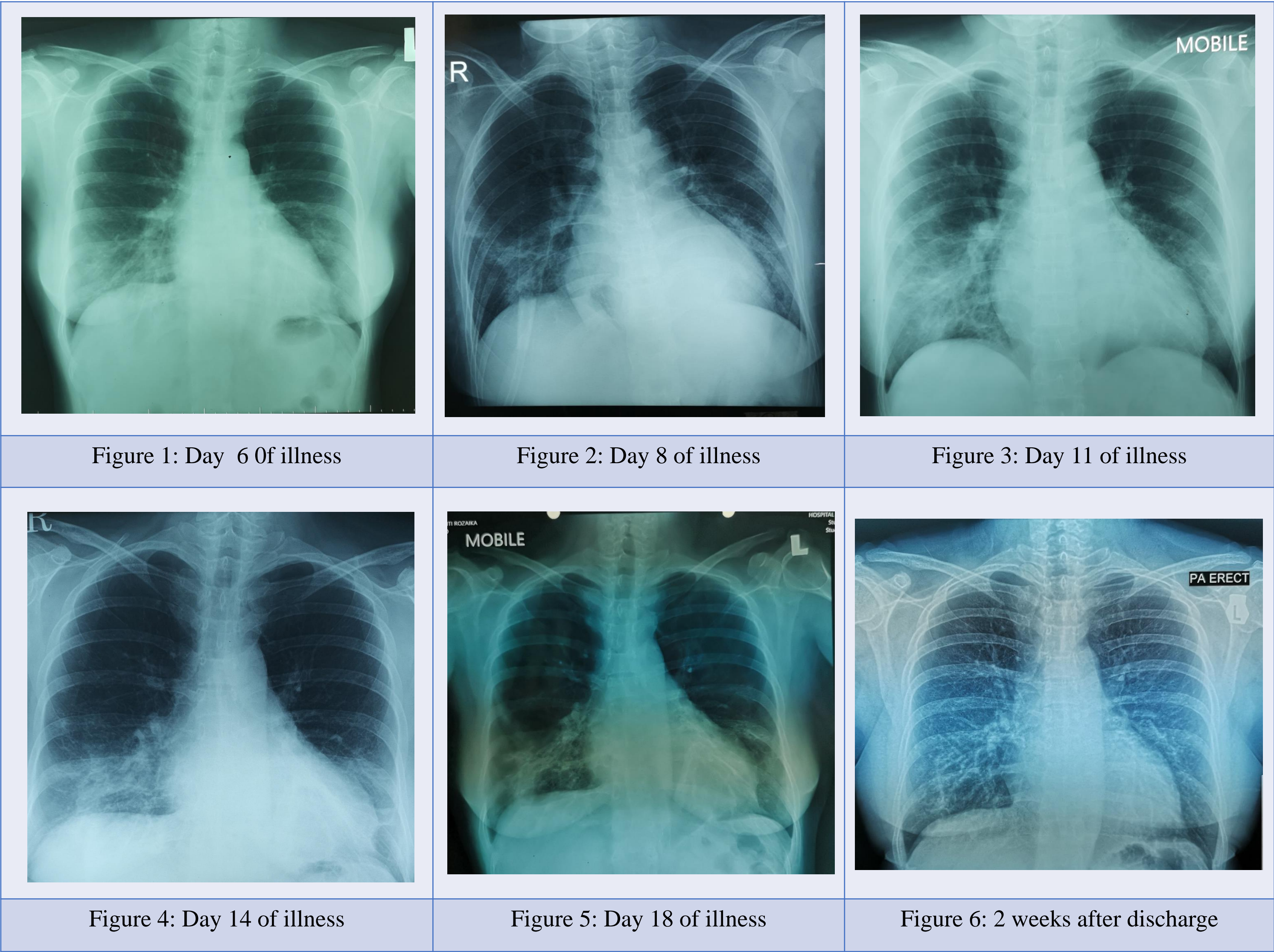


Figure A : Serial Chest Radiograph showing progressive pulmonary involvement

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