

A 10-year-old Male Patient with Severe COVID 19 Pneumonia in Jordan

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Abstract Severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) infection has caused a pandemic in the year 2020. Infection rates and severity of infection in the pediatric population were milder than in adults. This is a case of a 10-year-old male, who was previously healthy, except for being overweight. The patient presented with cough, fever and shortness of breath of two days duration prior to admission. Several of his family members were infected with the SARS-CoV2 virus. The patient developed significant hypoxia and was admitted to the hospital. CXR showed bilateral pulmonary infiltrates consistent with a viral infection. CT scan of his lungs showed areas of significant consolidation scattered over both lung fields, with minimal ground glass opacification. The patient had an elevated CRP, in addition to elevated liver enzymes. His RT-PCR test was positive for the SARA-CoV2 virus. The patient was treated with dexamethasone and IV antibiotics and had a good recovery. This is a case of significant lung disease with consolidation and air bronchograms, in a previously healthy, overweight 10-year-old male from Jordan. The degree of consolidation observed and clinical course of fast recovery and good outcome have not been described in the literature before up to our knowledge.

Keywords: *pediatric, Pneumonia, COVID 19*

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1. Introduction

The severe acute Respiratory syndrome virus 2 (SARS-CoV2) virus caused a global pandemic that started in the end of 2020, by Feb 2021 105 million people have been infected and 2,500,000 have died [1]. Children account for about 13% of infected patients [2,3,4]. The virus causes a milder illness in children, as only 2.5-4 % of pediatric cases require hospitalization [5] and fewer than 0.04 % result in death [6]. Moreover, according to a CDC report 33% of pediatric COVID 19 admissions require ICU admission [7,8]. Patients with underlying disease and immunodeficiencies, as well as overweight pediatric patients are at risk for severe disease [9,10]. Pediatric patients with more severe disease had pneumonia [11,12], usually they presented with ground glass opacities and consolidations [12,13,14].

In this case report we discuss a previously healthy, but overweight, 10-year-old male patient who developed a severe COVID 19 lung infection. This is a case of severe COVID 19 infection in an overweight pediatric patient who was previously healthy. This presentation is implied in studies but cases have not been discussed in detail [10,11]. There have been more case reports and case series of multisystem inflammatory syndrome in children

(MIS-C) than severe COVID 19 pneumonia [15]. This case also presents CT findings that have not regularly described in the pediatric population such as air bronchograms.

2. Case Presentation

2.1. History and Physical Exam

The patient was a previously healthy 10-year-old boy, whose father, brother and uncle contracted SARS-CoV2 infection. The father requiring ICU admission on October 27th, 2020. The patient presented to the ER on November 8th, 2020 with a 40 °C fever, shortness of breath, cough, sore throat, He did not present with diarrhea. Symptoms began two days prior to admission. A CXR showed bilateral infiltrates (Figure 1). The patient was admitted as a case of severe COVID 19 infection with pneumonia. The patient's condition deteriorated during the first day, and he required more oxygen. Initially, his oxygen saturation was 92% on oxygen provided by face mask (8L flow rate), and when his oxygen saturation still deteriorated, he was put on a non-rebreather mask with his blood oxygen saturations reaching to around 95%. At that point he was transferred to a COVID 19 hospital. His real time polymerase chain reaction (Rt-PCR) result was pending.

On arrival he was tachypneic and in mild respiratory distress. His oxygen saturation was 79% on room air, respiratory rate was 32 breath/min, heart rate 81 beats /min, and blood pressure 110/60 mmHg. His weight was 58 kg, height 145cm. His BMI 27.6, putting him at 102th percentile for his age (normal=14.2-19.4 kg/m²).

The patient had suprasternal retractions and decreased air entry with crackles over both lower lobes of the lung. Upon arrival to the coronavirus facility, the patient was given and regular face mask and his saturations improved improved to 93%.

2.2. Investigations

Laboratory blood work was obtained for the patient and the results are shown in [Table 1](#). They were remarkable for an elevated CRP, neutrophil count, and eventually elevated liver enzymes.

CT scan conducted on November 9th showed patchy areas of consolidation, collapse with air bronchograms at both lung fields. This was more prominent at the lower lobes and the right upper lobe which is consistent with pneumonic consolidation.

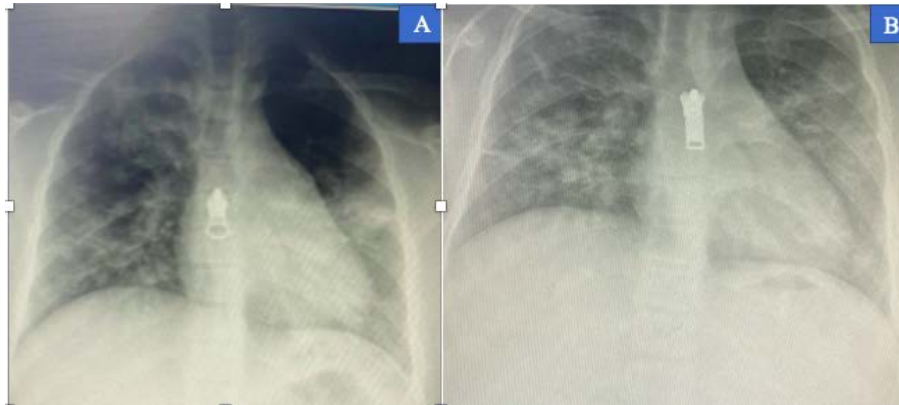


Figure 1. A) CXR taken on Nov 8th the day of admission to the first facility, showing scattered infiltrates involving the right lung, and left lung with areas of consolidation in the lingula and left lower lobe l. B) CXR taken Nov 12th shows interim improvement seen mainly in the left lung areas of consolidation

Table 1. Laboratory results for the patient

	Normal range [16]	8/Nov	9/Nov	10/Nov	11/Nov	12/Nov	13/Nov	15/Nov
CBC								
WBC	4.5-13.5 *10 ³ /mL	11,400		8900	7300		11600	12,100
Neutrophils %	40-70	78.4		90.1	81.3		82.6	81.3
Lymphocytes %	28-48	11.5		8	15.1		14	13.6
Monocytes %	0-0.8	10.1		1.8	2.9		1.5	4.3
Eosinophils %	0-6			0.0	0.4		1.2	0.6
Hemoglobin g/dl	11.5-15	14.2		14.1	15.8		14.5	14
Platelets 10 ³ /ml	150-350	260		288	394		403	258
PT sec	11-15		17.6		15.3			13.9
INR	0.8-1.2		1.36		1.18			
PTT sec	31-43		26		24.4			
Blood culture			No growth					
Na mEq/l	135-145		140	138	138			137
K mEq/L	3.5-5.1		4.3	4.5	4.7			4.3
Cl mEq/L	97-107			100	101			102
Urea mmol/l	2.1-7.1		6.6	3.5	3.6		3.7	
Creatinine μmol/l	27-62			45.3	43.9		44.7	
Glucose mmol/l	3.3-5.5				6.4			
AST U/L	15-40		62.4		97		47.9	51
ALT U/L	10-35		93.9		208		160	108
LDH U/L	110-295		422		450			
CPK U/L	20-200		61					
C reactive protein mg/dl	<5			292	100.5		35.3	10
Procalcitonin ng/ml	0.1-0.5			0.14				
RT-PCR					Neg		Positive	

N/A not available, PT: prothrombin time, INR: International ratio, PTT: partial thrombin time, AST: aspartate aminotransferase, ALT: alanine aminotransferase, LDH: Lactate dehydrogenase, CPK: creatinine phosphokinase.

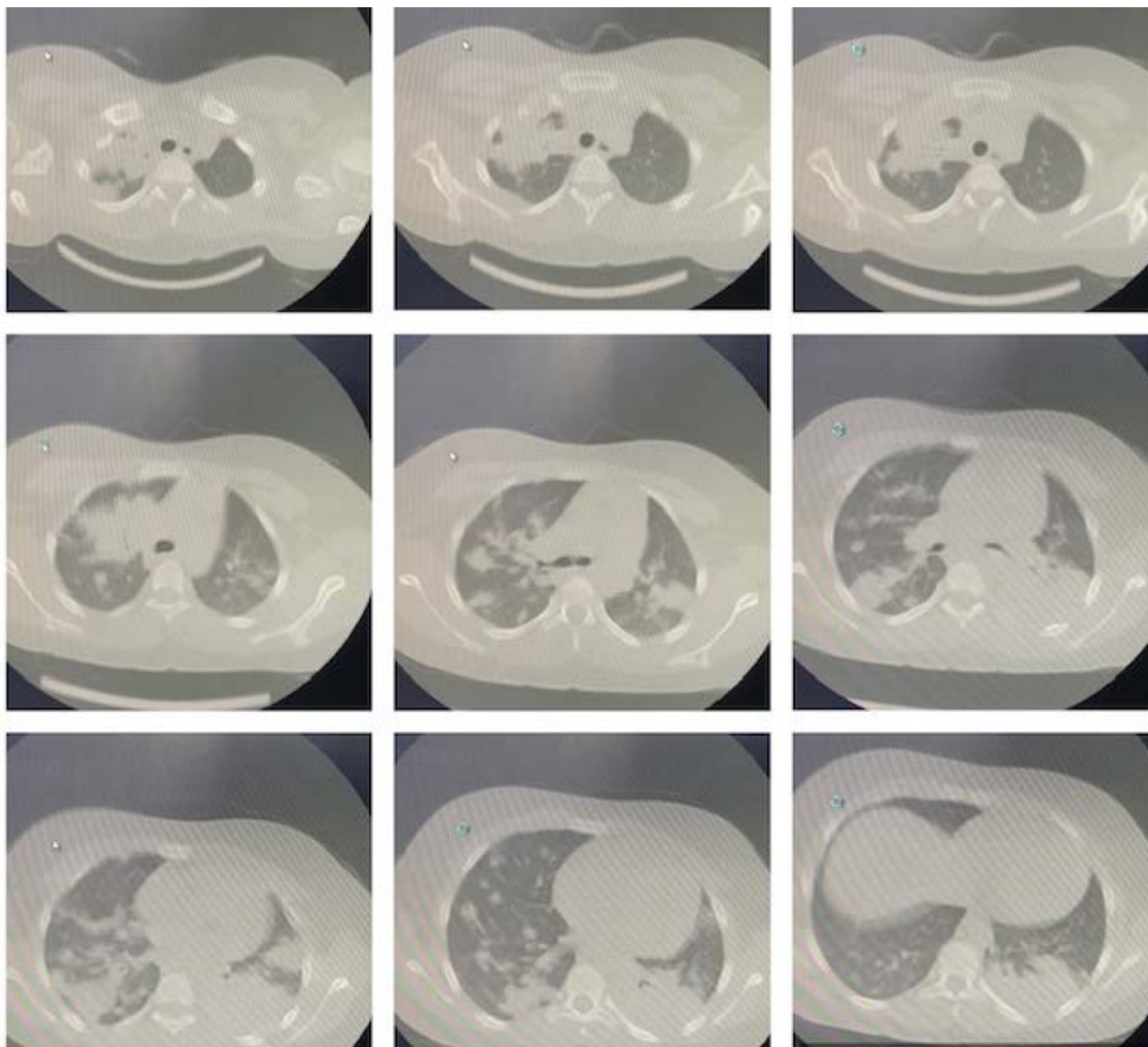


Figure 2. CT scan images obtained on Nov 8th the day of admission to the first facility, showing scattered areas of consolidation involving all the right lung lobes. Areas of consolidation involving the left lower lobe. Ground glass opacities seen in the right lower lobe.

2.3. Treatment

The patient was treated with broad-spectrum antibiotics (vancomycin and imipenem) for the duration of his admission. He was also started on IV dexamethasone 6 mg per day. Remdesivir was requested but was not approved by the hospital administration because the initial RT-PCT test results were negative and by the time the results of his second RT-PCR results were available (November 14th) he was off oxygen with significant improvement in his overall condition. Hematology service was consulted about starting an anticoagulant and the patient was started on a low dose enoxaparin 20mg bid. The medication was stopped after two days once the patient became more mobile.

2.4. Clinical Course

The patient was admitted to our hospital on November 9th. He had a low-grade fever on November 10th and then he became afebrile. He was able to keep his saturations above 95% on an oxygen face mask, and eventually on

November 12th he was weaned to room air. His respiratory rate went down from 32 on November 9th to 25 on November 11th and eventually to 22 breath per minute. Air entry improved over both lower lobes of the lung. CXR done on November 15th continued to show infiltrates in both lower lobes and right upper lobe (Figure 1) but improved from the time of admission. The patient was discharged the next day. The patient did not show up his follow up visit that was scheduled two weeks later. However, when we inquired about him over the phone at that time and two months later, his mother stated that he was doing very well, with no respiratory symptoms.

3. Discussion

This case report describes a severe SARS-CoV-2 infection in a 10-year-old child. The case fits the criteria for acute COVID-19 infection as the patient had a positive RT-PCR test and severe involvement of one or more organ systems [15,17]. The patient in this case had involvement of the respiratory and hepatic systems.

His CT images showed areas of bilateral lower lobe and right upper lobe consolidation. This pattern of involvement was first described in a study from China where ground glass opacities (GGO) were seen in 10/20 patients, consolidation with surrounding halo signs in 10/20 patients, and tiny nodules in 3/20 patients. However, none had severe consolidation as described in this report [18]. A study from Turkey reviewed CT findings in pediatric COVID-19 patients and describes children presenting with multiple lesions of bilateral distribution but does not clearly describe the consolidation seen in this patient [14]. A systemic review and meta-analysis of pediatric lung imaging features in COVID-19 found that the most common manifestation on chest CT was GGO (37% of patients) followed by consolidation or pneumonic infiltrates (22%). Air bronchograms were rarely reported in adults and have not been reported in children as in this case [12]. Whereas in a different meta-analysis and systematic review from China that included 517 CT scans did find air-bronchograms in 12% of them [19].

In this case, the possibility of superinfection cannot be ruled out, especially given the rapid improvement after starting antibiotics immunodeficiency. The patient was overweight and previous studies have shown that overweight children were prone to severe COVID-19 disease [9,10].

This case report describes significant consolidation and air bronchograms in an overweight 10-year-old child with a very good outcome.

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