COVID-19 Pneumonia: A Case Report

Pneumonia COVID-19: Caso Clínico

Ana Maria Grilo[1], Ana Gorgulho[1], Maria Margarida Andrade[1], Beatriz Fernandes[1], Luís Miguel Pereira[1]*

*** Corresponding Author**/Autor Correspondente:
Ana Maria Grilo [ana.fernandes.grilo@hospitaldecascais.pt]
Hospital de Cascais Dr. José de Almeida, Cascais, Portugal

Abstract

COVID-19 emerged in China and spread around the world, causing thousands of deaths. The presentation ranges from asymptomatic to severe bilateral pneumonia with acute respiratory distress syndrome (ARDS), in some cases requiring mechanical ventilation. Standard diagnosis relies on SARS-CoV-2 reverse transcriptase polymerase chain reaction (RT-PCR) and chest computed tomography (CT) helps to identify different stages of the disease. The rapidly evolving and continuous nature of COVID-19 scientific research translates a higher demand for these approaches.

We hereby report a case of COVID-19 in a 74-year-old female with mild symptoms and good clinical evolution with standard treatment. Sequential images of chest CT show disease evolution. Early prone positioning and respiratory physiotherapy improved recovery. Even when there is a considerable clinical improvement, clinicians should be alert for long-term respiratory consequences in these patients.

Keywords: Coronavirus Infections; COVID-19; Pneumonia, Viral; SARS-CoV-2; Severe Acute Respiratory Syndrome

Resumo

A COVID-19 surgiu na China e disseminou pelo mundo causando milhares de mortes. A sua apresentação varia de assintomática a pneumonia bilateral grave com síndrome respiratório agudo grave, em alguns casos com necessidade de ventilação mecânica. O diagnóstico é feito por reverse transcriptase polymerase chain reaction (RT-PCR) SARS-CoV-2 e a tomografia computorizada (TC) de tórax pode ajudar a identificar diferentes estágios da doença. A natureza contínua e em rápida evolução da pesquisa científica COVID-19 traduz uma maior demanda por essas abordagens.

Relatamos um caso de COVID-19 numa paciente do sexo feminino, 74 anos, com sintomas leves e boa evolução clínica com tratamento padrão. Imagens sequenciais de TC de tórax mostram a evolução da doença. O posicionamento prono precoce e a fisioterapia respiratória facilitaram a recuperação. Mesmo quando há considerável melhora clínica, os médicos devem estar alerta para futuras sequelas respiratórias nestes pacientes.

Palavras-chave: COVID-19; Infeções por Coronavírus; Pneumonia Viral; SARS-CoV-2; Síndrome Respiratória Aguda Grave

1. Department of Internal Medicine, Hospital de Cascais Dr. José de Almeida, Cascais, Portugal.

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ORCID iD: 0000-0002-4828-6103

Introduction

In December 2019, an outbreak of viral pneumonia caused by a coronavirus was identified in Wuhan City, Hubei Province, China. This novel beta coronavirus, highly contagious, has been named SARS-CoV-2 and the disease caused by this virus COVID-19. By March 2020 the World Health Organization (WHO) declared it a global pandemic.[1]

The standard test for diagnosis is based on the detection of SARS-CoV-2 by means of a real-time reverse-transcriptase-polymerase chain reaction (RT-PCR) assay. This assay is performed on material obtained from nasopharyngeal swabs and is reported to have high sensitivity, albeit with false negatives occurring with uncertain frequency.[2]

An increasing body of evidence regarding the long-term consequences of COVID-19, as well as severe complications associated with the inflammatory response, is increasing interest in therapeutic strategies intended to reduce innate inflammation, interrupt viral damage, and promote virus-specific immunity.

Case Report

We present the case of a 74-year-old female with a past medical history of diabetes mellitus, hypertension, obesity, and osteoporosis, admitted for chills and myalgia that began approximately eight days prior to admission. At presentation, the patient denied chest pain, shortness of breath, palpitations, or diarrhea. There was no history of travelling.

On arrival to the emergency department, vital signs included fever, heart rate of 100 beats/minute and saturation of 89% on room air. The patient was alert and oriented to time, place, and person. Pulmonary and heart sounds were normal.

Significant laboratory results include anemia (Hemoglobin (Hb) 11.5 g/dL), white blood count (WBC) 10.2 x 10^9/L, absolute number of lymphocytes 2.0x10^9/L, C-reactive protein was 7.0 mg/dL (Table 1). Arterial blood gas analysis on air room showed pH 7.46, $PaCO_2$ 37 mmHg, PaO_2 64 mmHg, HCO_3^- 26.3 mmol/L and lactate 0.9 mmol/L. With oxygen supplementation, PaO2 on nasal cannula at 2 L was noted to be 86 mmHg.

Chest X-ray showed bilateral ground-glass opacities in the lower lobes (Fig. 1). Chest CT showed multiple ground glass opacifications and crazy paving (Fig. 2). RT-PCR SARS-CoV-2 came out to be positive.

During admission isolation and infection control ward measures were maintained and the patient started empirical antibiotic therapy with amoxicillin/clavulanic acid and azithromycin. During the following days, the patient began to have increasing oxygen requirements, worse PaO_2/FiO_2 was 238 mmHg.

Imaging reevaluation with chest CT showed multiple basal and peripheral alveolar condensations with ground glass opacifications.

Table 1. Laboratory analysis.

	Day 1	Day 7	Day 12	Normal Range
WBC (x 10^9/L)	10.2	8.5	7.13	4.0-10.0
Abs lymphocyte count (x 10^9/L)	2.02	2.01	2.46	1.0-4.0
Abs Neutrophil count (x 10^9/L)	7.49	5.69	3.89	1.8-7.0
BUN (mg/dL)	19	25	31	21-43
Cr (mg/dL)	0.75	0.73	0.79	0.55-1.02
AST (UI/L)	41	36	34	15-37
ALT (UI/L)	35	39	55	14-39
LDH (UI/L)	399	286	235	81-234
Ferritin (ug/L)	581	-	255	10-291
CRP (mg/L)	8.34	2.13	0.71	<0.60

Prone position and respiratory physiotherapy were advised. Blood cultures came out negative, urine antigen test for *Legionella* and *Streptococcus pneumoniae* were negative, and low serum procalcitonin levels (< 0.06 ng/mL) were observed. With no presumption of bacterial co-infection antibiotic treatment was suspended.

Two weeks later, revaluation by chest CT, showed partial resolution of condensation with good evolution (Fig. 4). Hypoxemia improved progressively allowing the suspension of oxygen supplementation, with arterial blood gas analysis on air room showing PaO_2 94 mmHg.

Patient continued to test positive for SARS-CoV-2 for 30 days so remained at the Internal Medicine ward until conditions for home isolation were assured. At that point, the patient was discharged, and a follow-up external consultation was arranged.

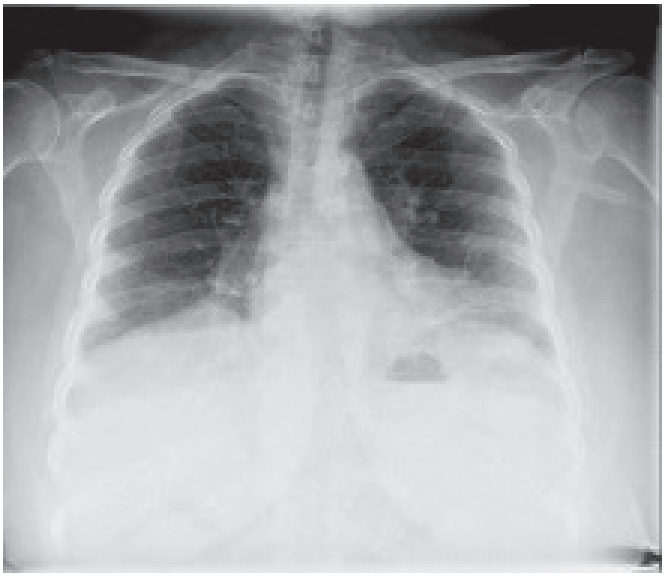

Figure 1. Chest X-ray at admission showing bilateral ground-glass opacities in the lower lobes.

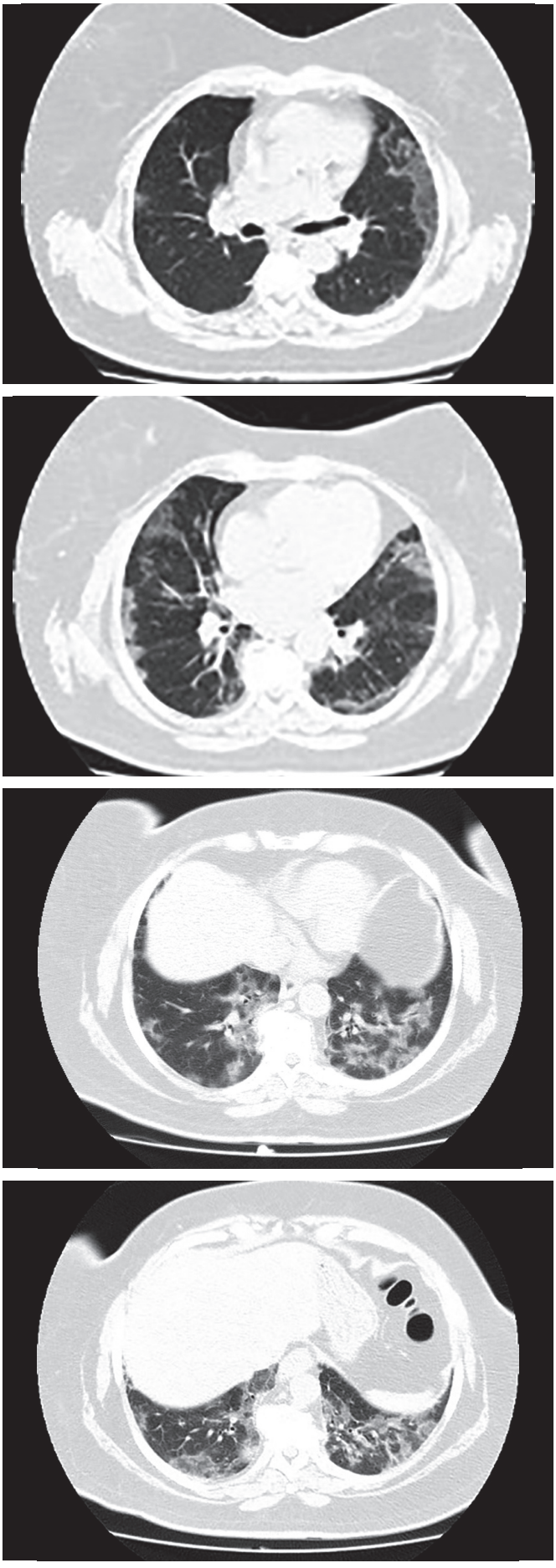

Figure 2. Chest CT at admission showing multiple ground glass opacifications and crazy paving.

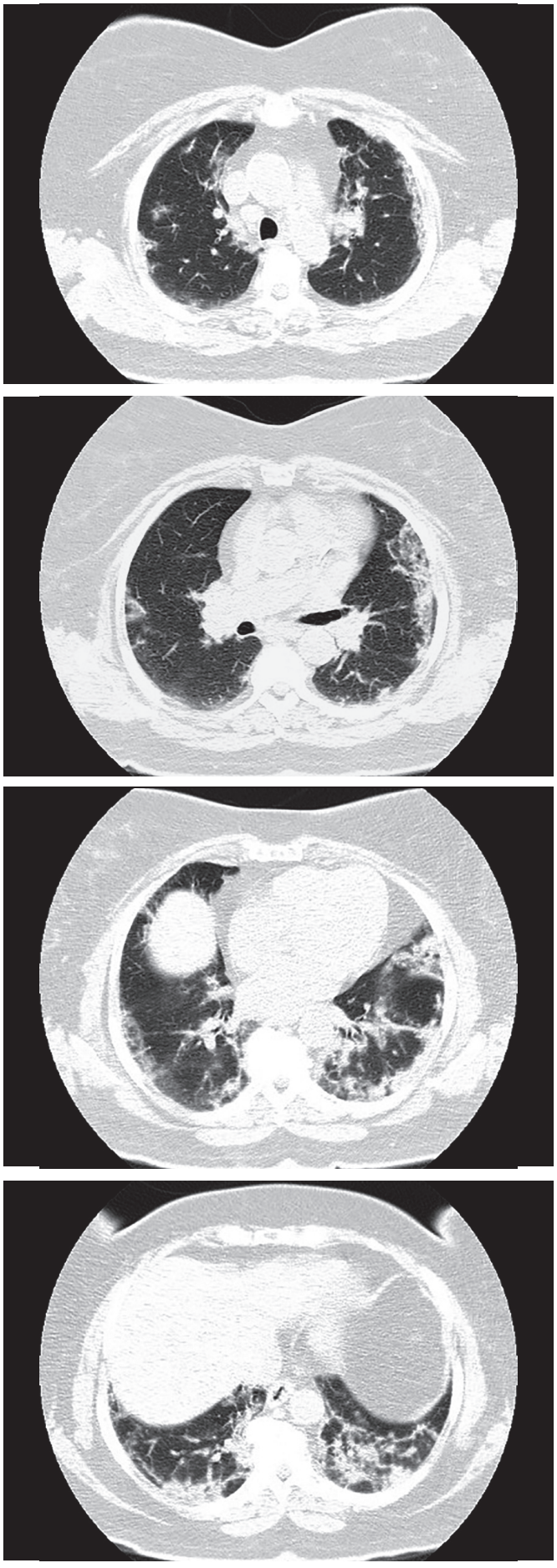

Figure 3. Follow-up chest CT at day 7 showing multiple basal and peripheral alveolar condensations with ground glass opacifications.

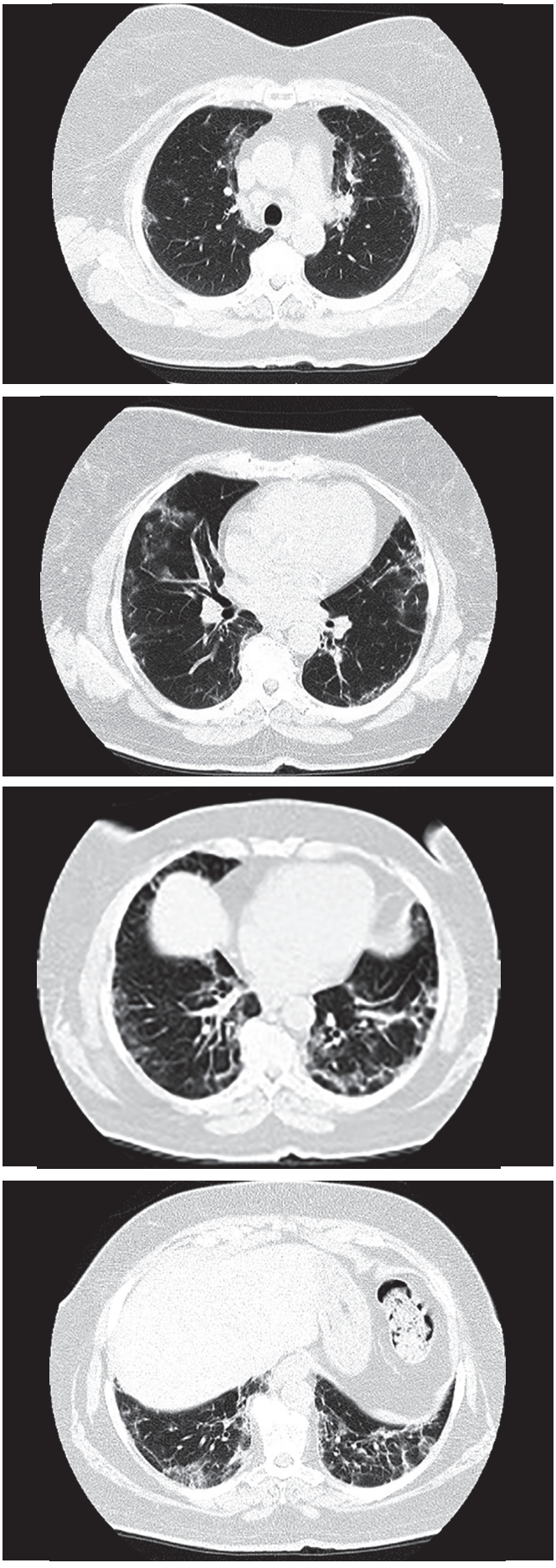

Figure 4. Chest CT after 14 days showing interlobular septal thickening and partial resolution of condensation.

Discussion

Patients presenting with COVID-19 have a large range of disease severity, from asymptomatic to acute respiratory distress syndrome (ARDS). Transmission occurs between humans primarily through respiratory droplets and contact routes, but airborne transmission is possible when there is exposure to aerosol-generating procedures.

The incubation period ranges from 2 to 14 days. Fever, a new and continuous cough, shortness of breath, fatigue, loss of appetite, anosmia and ageusia are the more common symptoms. Other non-specific symptoms include: shortness of breath, fatigue, loss of appetite, myalgia, sore throat, headache, nasal congestion, diarrhea, nausea and vomiting.[3]

Patients presenting with mild symptoms can deteriorate rapidly. Guidelines for the General Directorate of Portuguese Health mandate admission for COVID-19 patients with comorbidities such as chronic decompensated disease, immunosuppression, and active malignant neoplasia, at ward or intensive care unit, according to the disease severity.[4] This patient presents diabetes, hypertension, and obesity, all known risk factors for the disease, and clinical signs that indicated severity of the disease justifying the admission.[5]

Other respiratory infections, including bacterial pathogens can cause co-infection with viral pneumonia and overlap presenting features or symptomatology with COVID-19. Empirical antibacterial therapy is provided when co-infection is suspected, and a respiratory panel helps through management of the pathology.

Since the start of the pandemic, numerous efforts have been made to find a curative treatment for COVID-19, and multiple drugs have been prescribed as off-label, or for compassionate use. The initial protocol of our hospital included treatment with hydroxychloroquine and azithromycin, but studies seem to show no improvement with the use of hydroxychloroquine.[6] At the time of this reported case, clinical management included infection prevention, control measures, and supportive care including supplementary oxygen. Chronic medication was maintained, and comorbidities kept under control.

Prone positioning managing patients with ARDS has been shown to increase the number of recruited alveoli, decrease pleural pressure and improve alveolar shunting and tidal volume, and is therefore used for the management of ventilated COVID-19 patients. Forward studies present prone positioning as a safe option for non-ventilated patients, and has it been advised for hospitalized COVID-19 patients with dyspnea hypoxia or who require supplemental oxygen support.[7] In the case we report, prone position with tight vigilance and support from a respiratory physiatrist, following the guidelines for Physical Medicine and Rehabilitation of our hospital, helped improve clinical status during COVID-19 infection.

Data shows that there are different stages of evolution on chest CT in patients recovering from COVID-19 infection, with a progressive stage around 5 to 8 days where crazy-paving pattern, extension of ground glass opacification, and the initial development of consolidation are the main radiologic features and an adsorption stage after 14 days where consolidations gradually absorb, there is no evident crazy paving while fibrotic streaks, tractional bronchiectasis, bronchus distortion, and subpleural fibrotic lines become more prominent.[8,9] Thus, we continue to follow this patient closely to exclude long-term respiratory consequences of the disease.

There are some reports of cases that tested positive for a long time despite clinical improvement.[10] Some tests may pick up non-infective viral RNA fragments, but there is not enough information to consider these patients as not contagious, so patients were considered to still infectious until two negative swabs (within 24 hours) are obtained. In this particular case, after clinical improvement, the patient was discharged to home isolation with follow-up by the Public Health specialists.

Responsabilidades Éticas

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Patient Consent: Consent for publication was obtained.

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