

# Complications and long-term effects in a patient with atypical COVID-19 pneumonia: A case report

## Complicaciones y efectos a largo plazo en paciente con neumonía atípica por COVID-19: reporte de caso clínico

Edgardo Jiménez-Fuentes,\* Érika Barlandas-Quintana,‡ Karla del Carmen Piña-Moreno,‡ Asya Zubillaga,‡ Christian Marcelo Carrión-Astudillo‡

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### ABSTRACT

**Introduction:** the type 2 coronavirus infection causing severe acute respiratory syndrome (SARS-CoV-2) has spread rapidly, resulting in a pandemic causing severe disease in thousands of patients worldwide. Although the number of articles on this pathology is growing exponentially, few published clinical cases describe long-term pulmonary complications. **Case report:** a 57-year-old male had right pleural effusion secondary to coronavirus disease of 2019 (COVID-19); an endo pleural tube was placed without achieving complete lung expansion. He underwent an exploratory thoracotomy that revealed necrotizing pneumonia, bronchopleural fistula of the right middle lobe, and pachypleuritis as late pulmonary complications of SARS-CoV-2 infection. **Conclusion:** further research is required regarding the significant variability of complications due to COVID-19 and to consider surgical treatment for selected patients.

### RESUMEN

**Introducción:** la infección por coronavirus de tipo 2 causante del síndrome respiratorio agudo severo (SARS-CoV-2) se ha propagado rápidamente resultando en una pandemia, condicionando afección grave en miles de pacientes alrededor del mundo. Aunque el número de artículos sobre esta patología crece exponencialmente, hay pocos casos clínicos publicados que describen complicaciones pulmonares a largo plazo. **Reporte de caso:** masculino de 57 años con derrame pleural derecho secundario a enfermedad por coronavirus de 2019 (COVID-19), se coloca sonda endopleural sin lograr expansión pulmonar completa. Se presenta a toracotomía exploradora que revela neumonía necrosante, fistula bronchopleural del lóbulo medio derecho y paquipleuritis como complicaciones pulmonares tardías de infección por SARS-CoV-2. **Conclusión:** se requiere continuar una ardua investigación con respecto a la gran variabilidad de complicaciones por COVID-19 y plantear tratamiento quirúrgico para pacientes seleccionados.

\* General Surgery Resident. Department of General and Endoscopic Surgery.  
‡ Attending Physician. Chief of the Pneumology and Thoracic Surgery Service, Instituto Nacional de Cancerología.

General Hospital "Dr. Manuel Gea González", Ministry of Health (SSA), Mexico City.

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## INTRODUCTION

In late 2019 a new coronavirus was identified as a cause of atypical pneumonia in a group of patients in Wuhan, China. This microorganism has since spread rapidly, resulting in a pandemic. Such infection was designated by the World Health Organization with the term COVID-19 disease (i.e., coronavirus disease 2019).<sup>1</sup> The virus that causes COVID-19 is called severe

acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The increased morbidity and mortality from COVID-19 are mainly due to acute viral pneumonitis that progresses to acute respiratory distress syndrome (ARDS). The case of a patient with prolonged hospitalization and intubation secondary to COVID-19 disease is presented, as well as the pulmonary complications observed and their surgical resolution.

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### CLINICAL CASE PRESENTATION

A 57-year-old male with a history of long-standing systemic arterial hypertension is treated with losartan 50 mg every 12 hours. However, he started suffering from odynophagia, asthenia, and adynamic, so he went to a private physician who diagnosed pharyngotonsillitis and indicated unspecified antibiotic treatment. Five days later, he began to have non-quantified fever, dry cough in accesses, and medium effort dyspnea, so he went to the emergency room for evaluation.

The patient was assessed at the respiratory triage of our special hospital unit. It was noticed that his oxygen saturation was at 45%. Accordingly, he was given supplemental oxygen, which increased his oxygen saturation to 55%. Due to his critical condition, he was immediately admitted to the shock service as a priority type I. Due to respiratory failure, airway management was started, performing sedation and neuromuscular blockade with midazolam and rocuronium; then an orotracheal tube number 7.5 was placed, and introduced 21 cm from the dental arch. At the same time, it was decided to place a central venous catheter with right subclavian approach, without complications.

Invasive mechanical ventilation was started with the following parameters: total volume 30 ml, inspired oxygen fraction ( $\text{FiO}_2$ ) 100%, respiratory rate (RR) 24 rpm, positive end-expiratory pressure (PEEP) 14, inspiration:expiration ratio (I:E) 1:1.5, peak pressure ( $P_{\text{peak}}$ ) 36  $\text{cmH}_2\text{O}$ , while maintaining a oxygen saturation ( $\text{SatO}_2$ ) > 90%. Management with norepinephrine at 0.7  $\mu\text{g}/\text{kg}/\text{min}$  and dobutamine at 2.5  $\mu\text{g}/\text{kg}$  was also started. In addition, ceftriaxone, oseltamivir, and clarithromycin were administered. The following diagnoses were integrated: acute respiratory failure type 1, mixed acid-base imbalance (acute respiratory acidosis, lactic acidosis), probable atypical pneumonia versus severe ARDS (SARS-CoV-2, CURB 65 two points, PSI PORT 127 points, SMART-COP eight points), hydro-electrolyte imbalance (mild hypocalcemia) without electrocardiographic repercussions.

A polymerase chain reaction (PCR) swab was performed for SARS-CoV-2, which was reported positive on 27-04-20. The patient was presented to the intensive care unit on 28-04-20 as a confirmed case of severe acute respiratory failure syndrome (ARDS) and advanced airway management.

He was extubated on 28-05-20, after which the patient presented an 80% right pleural effusion, so he was referred to the general surgery service on 05-06-20 for placement of an endo pleural probe (*Figure 1*).

However, the patient evolved in a torpid manner without achieving pulmonary re-expansion, so he was scheduled for right posterolateral thoracotomy that was performed on 10-06-20, observing necrotizing pneumonia, bronchopleural fistula of the right middle lobe, and pachypleuritis as transoperative findings (*Figure 2*). Approximately 200  $\text{cm}^3$  of cloudy material was drained; cultures were sent to the lab, and an endo pleural tube and two Jackson-Pratt drains, one anterior and the other posterior, were left as drains (*Figure 3*).

The patient progressed towards improvement. It was decided to remove the endo pleural tube on 15-06-20; he was extubated on 18-06-20, and the anterior Jackson Pratt drain was removed on 19-06-20. He was discharged home on 06-23-20 to continue with outpatient follow-up.



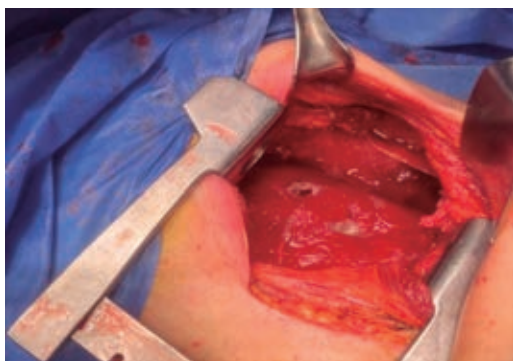
*Figure 1: Chest X-ray after endo pleural probe placement showing a right pleural effusion of approximately 80%.*

Subsequently, a pathology report was collected, which mentioned acute fibrinopurulent and chronic organized pachypleuritis with few foreign body type giant cells. These are histological findings compatible with ulcerated bronchopleural fistula with granulation tissue, chronic inflammation with few foreign body type giant cells, recent and old hemorrhage, with irregular scar-like fibrosis in the adjacent lung parenchyma.

## DISCUSSION

Following the acquisition of SARS-CoV-2 infection, multiple associated complications can occur. Age is the leading risk factor for progression to acute respiratory distress syndrome (ARDS).<sup>2-5</sup> Comorbidities, high fever ( $\geq 39$  °C), smoking history, and certain laboratory features also predict progression and death from COVID-19. The need for mechanical ventilation in critically ill patients ranges from 30 to 100%.<sup>3,5-8</sup> However, lung compliance is high compared to other etiologies of ARDS. The incidence of barotrauma in those requiring mechanical ventilation has been reported in up to 25% of patients despite low tidal volumes and peak pressures.<sup>9</sup> On the other hand, pleural effusions are considered unusual.<sup>10</sup>

There needs to be more data describing the pulmonary pathology of COVID-19 pneumonia in critically ill patients. Most autopsy reports describe mononuclear inflammation,<sup>11,12</sup>



**Figure 2:** A bronchopleural fistula in the middle lobe of the right lung measuring approximately 1 × 1.5 cm during posterolateral thoracotomy.



**Figure 3:** Chest X-ray taken 24 hours after the procedure, showing adequate lung expansion, presence of two Jackson Pratt drains (anterior and posterior), and an endo pleural tube.

hyaline membrane changes, and micro vessel thrombosis suggestive of early ARDS (i.e., exudative, and proliferative phases of diffuse alveolar damage [DAD]).<sup>12-14</sup> Other findings include bacterial pneumonia (isolated or superimposed on DAD) and viral pneumonitis.<sup>13,14</sup> Less common findings include acute fibrinous organizing pneumonia (late stages),<sup>15</sup> amyloid deposition, and rarely, alveolar hemorrhage and vasculitis.<sup>14</sup>

In this patient, there were related histopathologic findings, chronic inflammation with rare foreign body-like giant cells, and findings described as “less common” or atypical, including pachypleuritis, and ulcerated bronchopleural fistula, hemorrhage, and fibrosis of adjacent lung parenchyma. The percentage of patients with long-term sequelae is currently unknown; however, a retrospective study of 110 patients with COVID-19 reported persistent pulmonary function abnormalities at discharge in patients with mild and severe pneumonia.<sup>15</sup>

## CONCLUSION

This case leads us to consider the significant variability of possible complications secondary to this new virus and the need for further research. Likewise, this case exemplifies the need to consider surgical treatment for

those critical patients with a compromised pulmonary distensibility who do not respond to conventional medical treatment. However, patients should be carefully selected not to cause further aggravation and to offer resolute treatment to candidates for it.

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#### Correspondence:

Érika Barlandas-Quintana

E-mail: barlandas@gmail.com