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# Severe Pneumonia due to Sphingomonas Paucimobilis and Pneumocystis Jiroveci in a 32-Year-Old Patient Hospitalized for Suspected SARS-CoV-2 Pneumonia

**Boubacar Djelo DIALLO[1], Ousmane Aminata BAH[2,3], Alhassane DIALLO[4], Miguel Carlos-Bolumbu[5], Lansana Mady CAMARA[1]**

[1]Faculté des Sciences et Techniques de la Santé, Université Gamal Abdel Nasser de Conakry, Service de Pneumo-Phtisiologie, CHU Conakry, Hôpital National Ignace Deen de Conakry, Conakry, Guinea.

[2]Centre d'Imagerie de Référence des Armées (CIRA) Conakry Guinée.

[3]Service de Radiologie Hôpital National Donka, CHU Conakry, Université de Conakry, Guinée.

[4]INSERM, U1137, CIC-EC 1425, Department of Epidemiology, Biostatistics, and Clinical Research, AP-HP, Hospital Bichat, University Paris Diderot, Paris, France.

[5]Urgences réanimation centre hospitalier Sud Essonne CHSE, Paris, France.

***Corresponding Author:** Dr. Boubacar Djelo DIALLO, MD, Service de Pneumo-Phtisiologie, CHU Conakry, Hôpital National Ignace Deen de Conakry, Conakry, Guinea.*

## Abstract

*The management of acute pneumonia is a real challenge for clinicians in the context of the COVID-19 pandemic. Sphingomonas paucimobilis and Pneumocystis jiroveci are opportunistic organisms whose clinical and radiological expression may be similar to the novel Coronavirus pneumonia (SARS-COV-2). We report the medical observation of a 32-year-old patient admitted to continuing care for the management of acute febrile dyspnea with suspected SARS-COV-2pneumonia. The initial clinical and biological evaluation ruled out coronavirus disease. The diagnosis of severe pneumonia due to Sphingomonas paucimobilis and Pneumocystis jiroveci was retained with a favorable outcome under antibiotic treatment. The CT scan showed resolution of the parenchymal lesions and ground glass images. However, residual cavity type complications have been identified, which may be responsible for fungal grafting. HIV testing and screening for opportunistic lung infections should be part of the algorithm for the management of patients with suspected SARS-COV-2disease in countries with high prevalence of HIV infection.*

## Introduction

Sphingomonas paucimobilis, formerly known as Pseudomonas paucimobilis, is a gram-negative, yellow-pigmented, strictly aerobic, Gram-negative bacillus with a single polar flagellum [1]. Sphingomonas paucimobilis has been associated with various infections in humans, including bacteremia, pneumonia, catheter-related infections, meningitis, peritonitis, osteomyelitis, septic arthritis, postoperative endophthalmitis, pulmonary empyema, splenic abscess, urinary tract infections and biliary infections of the tract [2]. As for Pneumocystis jiroveci, it is an atypical fungus that causes pneumonia in immunocompromised human hosts, especially those with cell-mediated immunity deficiency. P. jiroveci lives almost exclusively in the pulmonary alveoli, adhering to the alveolar epithelium. These two conditions are classified as opportunistic infections [3].

## Report

32-year-old patient, an alcohol-smoking finance executive since the age of 15 with an estimated smoking rate of around 10 pack-years, consults in a private practice for dry cough, dyspnea, fever, physical asthenia that has progressed for 72 hours. After an initial assessment he was referred to a structure for the management of the SARS-COV-2 disease, an RT PCR test was performed and was found to be negative, he was then referred to the Pneumology department. Her

clinical condition worsened with dyspnea assessed at a 3 mm CR stage with 80% SaO2, an emergency uninjected thoracic CT scan showed bilateral ground glass images associated with thickening of the septa and a right parenchymal nodule (figure 1).

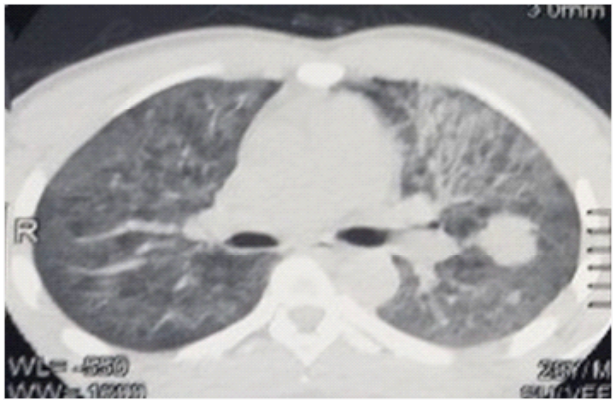

**Figure1.** *Non-injected thoracic CT in axial cut, parenchymal window, bilateral ground glass images associated with thickening of the septa and a right parenchymal nodule.*

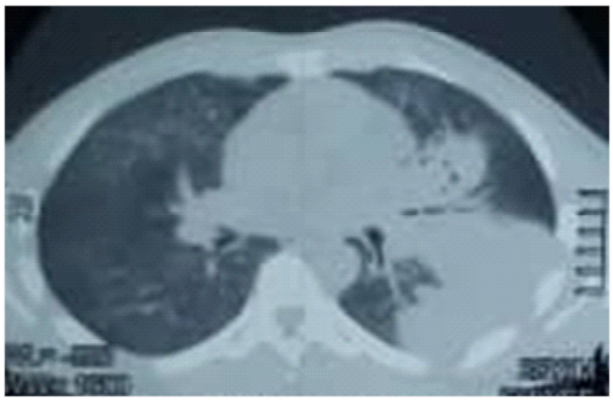

**Figure2.** *Control thoracic CT on D4 not injected in axial slice, parenchymal window increased initial lesions with appearance of excavation and two other parenchymal nodules.*

In view of the clinical picture, a new SARS-CoV-2 RT PCR test was performed and was negative. Antibiotic treatment with Ceftriaxone 1g per day combined with oxygen therapy was instituted. On the prescribed blood count, we found a polynuclear neutrophilic hyperleukocytosis at 30,000 cells per mm3 associated with positive HIV serology. Glycemia, liver and kidney tests were normal. Four days later, the clinical condition did not improve and a new thoracic CT scan was performed which showed a marked increase in the initial lesions with the appearance of excavation.

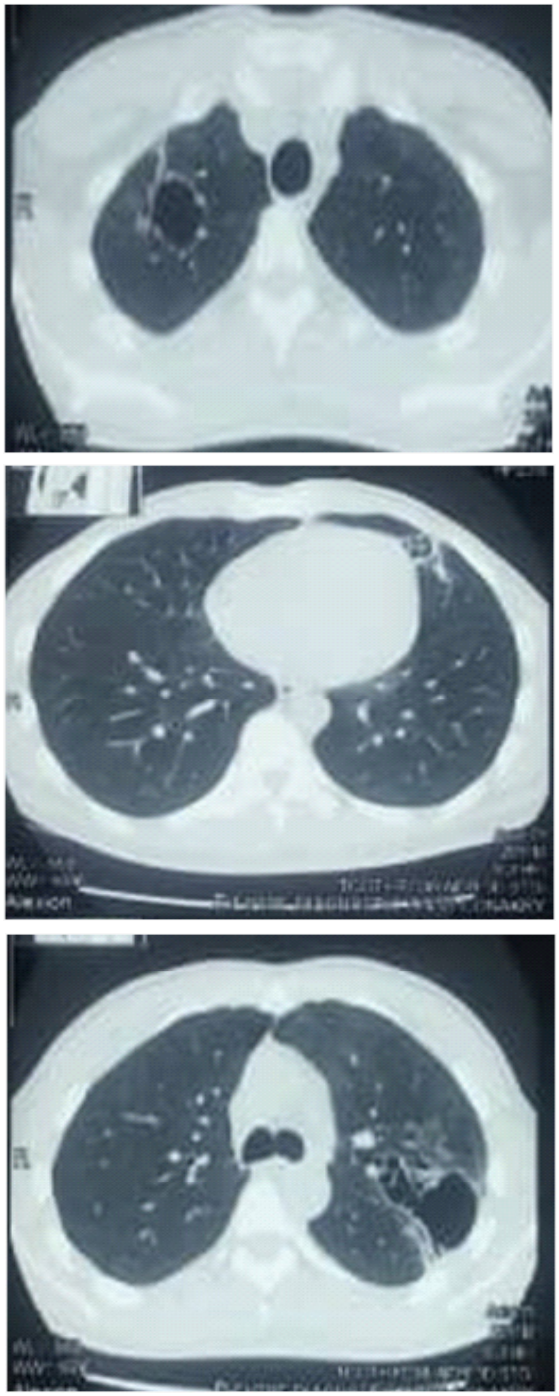

**Figure3.** *Control thoracic CT on D14 not injected in axial slice, parenchymal window. Resolution of the initial frosted-glass parenchymal lesions and nodular lesions (a) with the appearance of sparse sequellar-looking cavities in the lung parenchyma (b and c).*

An addition of Triméthoprime-Sulfaméthoxazole (Bactrim) 960 mg, 02 tablets three times a day, plus Folic acid 5mg a day, had been made, 72 hours after the

patient had remained febrile, a bronchial endoscopy with LBA was then made, the bacteriological and mycological analysis with antibiogram concluded in the presence of Sphingomonas paucimobilis and Pneumocystis Jiroveci. The strain of Sphingomonas paucimobilis was resistant to common antibiotics (Beta lactamins, quinolones, aminoglycosides) with sensitivity to imipenemes. Treatment with Imipeneme 1 g every 8 hours intravenously was started, the outcome was quickly favorable with apyrexia after 48 hours and improvement in respiratory symptoms, the patient was weaned from oxygen after 4 days of treatment with Imipeneme. A follow-up thoracic CT scan performed on day 14 showed resolution of the initial parenchymal frosted glass lesions and nodular lesions with the appearance of sparse sequellar-looking cavities in the lung parenchyma.

## Discussion

The management of patients with acute febrile dyspnea in the context of an epidemic of coronavirus disease is a real challenge for the clinician. In this work, we report the medical observation of a 32-year-old patient who presented with acute febrile dyspnea for which he was referred to a SARS-CoV-2 care facility. Clinically, he presented elements of suspicion of SARS-CoV-2 disease associated with chest CT showing ground glass opacities associated with a pulmonary parenchymal nodule. The negativity of RT PCR tests, the very rapid evolution of radiological abnormalities, hyperleukocytosis at more than 20,000 elements per mm3 have led the clinical team to move towards an infectious bacterial etiology of pneumonia. To this was added the positivity of HIV serology directing towards opportunistic pulmonary infections, hence the question of the place of HIV screening in suspects but also confirmed cases of SARS-COV-2 disease in the countries or populations with high HIV prevalence. Certain opportunistic infections including Pneumocystosis may have the same clinical and radiological presentation of SARS-COV-2 pneumonia, so it seems essential to integrate the offer of HIV screening in patients with SARS-COV-2 in order to reduce the diagnostic errors.

Chest CT is a sensitive test for the diagnosis of Pneumocystosis; it may present with diffuse ground-glass hyperdensities that progress to consolidation in the late stages of the disease [4]. Nodules, pneumothoraxes and rarely cavities can also be found [5].

Confirmatory laboratory diagnosis is based on direct microscopic examination of bronchoalveolar lavage fluid (BAL), which is currently the first-line examination for diagnosing pneumocystosis; the combination of two complementary techniques is necessary to detect the various characteristic fungal forms (asci / ascospores and so-called vegetative trophic forms) and to increase the sensitivity of the examination, either by two stains, or by staining and immunofluorescence research (more sensitive). It can identify other infectious agents responsible for opportunistic infections in these immunocompromised patients by staining [4].

From a therapeutic standpoint, the standard treatment is cotrimoxazole (trimethoprim / sulfamethoxazole or TMP-SMZ) for three weeks intravenously (IV), sometimes orally in moderate forms. This molecule destroys the protozoan forms of parasites and other microorganisms and is believed to be active on the trophozoites of P. jiroveci. In case of contraindication or intolerance to cotrimoxazole, the main alternatives are atovaquone or dapsone (+/- trimethoprim) in the mild to moderate forms and the combination clindamycin-primaquine or IV pentamidine in the moderate forms to severe [4, 6]. The demonstration of acute pneumonitis with ground-glass CT images in an HIV endemic area should lead to the search for opportunistic infections including pneumocystosis. The concomitant presence of SphingomonasPaucimobilis could be explained in part by the opportunistic nature of the germ, S. paucimobilis was isolated for the first time by Holmes et al. and named Pseudomonas paucimobilis in 1977 [2]. This germ is found particularly in subjects with immunosuppression, cancer patients and diabetes [2]. Lin et al. evaluated 16 cases of S. paucimobilis bacteremia and found a malignancy rate of 57.1% and a diabetes rate of 40.5% [1]. So far, a variety of infections have been reported with this microorganism, such as sepsis, septic pulmonary embolism, septic arthritis, peritonitis and endophthalmitis.

## Conclusion

Suspicion of SARS-CoV-2 Pneumonia should involve careful differential diagnosis to reduce diagnostic errors and the risk of death; Likewise, HIV testing should be systematic in HIV-endemic areas, in particular to search for opportunistic pulmonary infections.

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